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UNITED STATES CENTENNIAL COMMISSION.

INTERNATIONAL EXHIBITION,

1876.

OFFICIAL CATALOGUE

I. DEPARTMENT OF MINING AND METALLURGY.

II. DEPARTMENT OF MANUFACTURES.

III. DEPARTMENT OF EDUCATION AND SCIENCE.

MAIN BUILDING.

PHILADELPHIA:

PUBLISHED BY JOHN R. NAGLE AND COMPANY,

PRINTED AT THE RIVERSIDE PRESS, CAMBRIDGE, MASS.

1876.



OFFICE OF THE CENTENNIAL CATALOGUE COMPANY AND S. M. PETTENGILL & CO., ADVERTISING AGENTS.
Between Machinery Hall and Offices of the Centennial Board of Finance.



MAIN EXHIBITION BUILDING.

K.A.S

UNITED STATES CENTENNIAL COMMISSION.

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Philadelphia

INTERNATIONAL EXHIBITION,

1876.

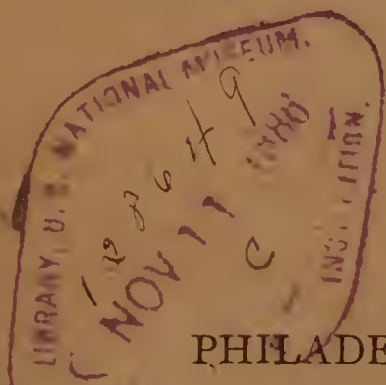
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CONTENTS.

Subject index, National exhibits,	vi
The International Exhibition of 1876,	vii
United States Centennial Commission,	ix
Centennial Board of Finance,	x
Plan of Exhibition Grounds,	xii
The Main Exhibition Building,	i
Key to the Notation,	3
Classification of Department of Mining and Metallurgy,	5
Catalogue of Department of Mining and Metallurgy,	13
Classification of Department of Manufactures,	103
Catalogue of Department of Manufactures,	107
Classification of Department of Education and Science,	251
Catalogue of Department of Education and Science,	257
Catalogue for Annex,	295
Alphabetical index of Commissioners, Officers, and Exhibitors in Departments I, II, III,	303

SUBJECT INDEX, NATIONAL EXHIBITS.

DEPT. I.

DEPARTMENT II.

DEPT. III.

NATIONS.	Statistical Preface.	Com'rs to the Exhibition.	Mineral Ores, Stones, Mining Products.	Metallurgical Products.	Mining, Engineering.	Chemical Manufactures.	Ceramics, Pottery, Porcelain, Glass, etc.	Furniture, etc.	Yarns and Woven Goods of Vegetable or Min'l Mater's.	Woven and Felted Goods of Wool, etc.	Silk and Silk Fabrics.	Clothing, Jewelry, etc.	Paper, Blank Bks. Stationery.	Weapons, etc.	Medicine, Surgery, Prothe's.	Hard're, Edge Tools, Cut'ry, Metallic Pro.	Fabrics of Veg., An., or Min. Materials.	Carriages, Vehicles, and Accessories.	Educ'al Systems, Methods, Libraries.	Institut's and Organizations.	Scientific and Philo. Instru's and Methods.	Engineering, Architecture, Maps, etc.	Physical, Social and Moral Condition of Man.
United States..... {	7	...	13	19	23	107	111	113	118	121	123	124	129	132	133	134	139	140	257	261	261	265	266
Great Britain.....	25	28	29	29	...	141	142	295	145	146	147	148	148	149	149	149	149	299	268	...	268	...	...
New Zealand.....	36	39	40	40	...	163	163	...	163	...	163	...	...	164	...	...	164	...	...	...	...	164	164
New South Wales.....	30	32	33	33	33	150	150	150	150	151	...	151	151	...	151	...	151	151	270	270	270	270	270
Victoria.....	33	35	35	36	36	153	153	153	154	154	154	154	...	154	...	...	...	154	270	...	270	271	271
South Australia.....	159	160	161	...	...	161	...	...	...	...	...	...	161	161	...	...	...	...	161	...	...	162	...
Cape of Good Hope...	165	166	167	167	...	167	...	167	...	...	167	...	167	167	167	...	167	...	167	...	...	168	...
Jamaica.....	169	169	...	...	...	170	...	...	170	...	...	170	170	...	170	170	170	170	...	...	...	...	...
Canada.....	41	43	44	48	...	171	172	173	174	174	174	174	175	176	176	176	177	177	271	272	272	272	272
France.....	48	52	In Agricul. Depart.			179	180	180	182	182	182	183	185	185	186	186	186	187	273	274	274	275	276
Germany.....	54	59	60	60	60	187	188	188	189	189	190	190	191	191	191	192	192	192	276	...	277	...	278
Austria.....	61	66	66	66	...	192	193	193	194	194	194	194	197	198	198	198	198	198	279	279	279	279	280
Switzerland.....	67	70	70	70	...	199	199	199	199	199	199	200	200	200	201	201	201	...	280	281	282	283	284
Belgium.....	71	73	74	74	...	201	201	202	202	203	203	203	204	204	204	204	204	...	286	287	287	287	287
Netherlands.....	75	79	79	...	...	205	205	205	205	205	206	206	206	206	206	206	206	...	288	288	288	288	289
Denmark.....	207	208	...	...	...	209	209	209	209	209	209	209	...	...	...	...	...	...	209	209	209	210	...
Sweden.....	80	83	84	84	...	211	211	211	212	212	212	212	213	213	213	213	214	214	289	290	290	290	...
Norway.....	85	88	88	...	...	214	214	215	215	215	...	215	215	215	215	215	215	216	291	...	291	291	291
Italy.....	89	94	94	94	...	216	218	218	218	218	218	219	219	220	220	220	200	200	292	292	292	292	292
Egypt.....	221	223	224	224	...	224	224	224	224	224	224	224	224	224	225	225	...	225	225	225	225	225	225
Tunis.....	226	227	...	...	...	227	227	227	...	227	227	227	...	227	...	...	...	227	...	...	227	...	227
Orange Free State.....	228	229	230	...	...	...	...	...	...	...	...	230	...	...	...	...	...	230	...	...	...	...	...
Luxemburg.....	...	...	...	...	...	230	...	...	...	...	...	230	...	...	...	...	...	...	...	...	...	...	...
China.....	231	231	231	231	...	231	231	231	231	231	231	231	231	...	231	231	231	...	...	...	231	...	231
Japan..... {	235	235	...	...	...	237	237	237	237	237	237	238	238	...	238	...	238	...	238	...	...	...	...
Hawaii.....	240	241	242	...	...	239	239	239	239	...	239	239	239	...	...	...	239	...	239	...	239	...	...
Brazil.....	95	96	97	97	...	242	...	242	242	...	...	242	...	...	...	...	242	241	242	242	...	242	242
Argentine Republic....	97	98	99	101	...	243	243	244	244	244	...	244	244	244	245	...	245	245	293	...	293	293	...
	97	98	99	101	...	245	246	246	246	247	247	248	249	249	249	...	250	250	293	294	294	294	294

THE INTERNATIONAL EXHIBITION OF 1876.

THE Congress of the United States, by an act approved March 3d, 1871, provided that the centennial anniversary of the promulgation of the Declaration of American Independence in Philadelphia should be celebrated in that city "by holding an International Exhibition of Arts, Manufactures, and Products of the Soil and Mine." The preparation of the Exhibition was, by the act, confided to the United States Centennial Commission, composed of a commissioner and alternate commissioner nominated by the governor of each State and Territory, and confirmed by the President of the United States. A subsequent act, approved June 1st, 1872, created the Centennial Board of Finance, charged with the financial conduct of the Exhibition.

A proclamation by the President of the United States, dated July 3d, 1873, announced the International Exhibition, and commended it to all nations. An act of Congress, approved June 5th, 1874, requested the President, in the name of the United States, to invite the governments of foreign nations to participate in the Exhibition. The invitation thus extended was accepted by the governments of

Argentine Republic,	Queensland,	Netherlands,
Austria-Hungary,	New Zealand,	Norway,
Belgium,	New South Wales,	Orange Free State,
Brazil,	Victoria,	Peru,
Canada,	South Australia,	Portugal,
Chili,	India,	Russia,
China,	Cape Colony,	Spain,
Denmark,	Bermuda, and	Sweden,
Egypt,	Jamaica,	Switzerland,
France, with Algeria,	Hawaii,	Tunis,
Germany,	Italy,	Turkey,
Great Britain, with colonies, viz.	Japan,	Venezuela.
	Mexico,	

The Centennial Commission provided for the classification of the objects to be exhibited in seven departments, which were referred to five exhibition buildings in this manner:

DEPARTMENT.	BUILDINGS.	ACRES COVERED.
I. Mining and Metallurgy, } II. Manufactures, } III. Education and Science, }	Main Building,	21.47
IV. Art,	Art Gallery	1.5
V. Machinery,	Machinery Building,	14.
VI. Agriculture,	Agricultural Building,	10.
VII. Horticulture,	Horticultural Building,	1.5
Total,		48.47

The applications for exhibiting space, however, both at home and from abroad, so exceeded the calculations that had been made as to necessitate the erection of annexes supplementing the capacity of each of these buildings. Enumerations of these additional structures will be found on subsequent pages. The classes of objects grouped in the several departments are indicated in the following synopsis of the classification of the Exhibition.

SYNOPSIS OF THE CLASSIFICATION.

LOCATION.	DEPARTMENTS.	CLASSES.	GROUPS.
MAIN BUILDING.	I. MINING AND METALLURGY.	100—109	Minerals, Ores, Stone, Mining Products.
		110—119	Metallurgical Products.
		120—129	Mining Engineering.
	II. MANUFACTURES.	200—205	Chemical Manufactures.
		206—216	Ceramics, Pottery, Porcelain, Glass, etc.
		217—227	Furniture, etc.
		228—234	Yarns and Woven Goods of Vegetable or Mineral Materials.
		235—241	Woven and Felted Goods of Wool, etc.
		242—249	Silk and Silk Fabrics.
		250—257	Clothing, Jewelry, etc.
		258—264	Paper, Blank Books, Stationery.
		265—271	Weapons, etc.
		272—279	Medicine, Surgery, Prothesis.
		280—284	Hardware, Edge Tools, Cutlery, and Metallic Products.
		285—291	Fabrics of Vegetable, Animal, or Mineral Materials.
		292—296	Carriages, Vehicles, and Accessories.
	III. EDUCATION AND SCIENCE	300—309	Educational Systems, Methods, and Libraries.
		310—319	Institutions and Organizations.
		320—329	Scientific and Philosophical Instruments and Methods.
		330—339	Engineering, Architecture, Maps, etc.
		340—349	Physical, Social, and Moral Condition of Man.
ART GALLERY.	IV. ART.	400—409	Sculpture.
		410—419	Painting.
		420—429	Engraving and Lithography.
		430—439	Photography.
		440—449	Industrial and Architectural Designs, etc.
		450—459	Ceramic Decorations, Mosaics, etc.
MACHINERY BUILDING.	V. MACHINERY.	500—509	Machines, Tools, etc., of Mining, Chemistry, etc.
		510—519	Machines and Tools for working Metal, Wood, and Stone.
		520—529	Machines and Implements of Spinning, Weaving, etc.
		530—539	Machines, etc., used in Sewing, Making Clothing, etc.
		540—549	Machines for Printing, Making Books, Paper Working, etc.
		550—559	Motors, Power Generators, etc.
		560—569	Hydraulic and Pneumatic Apparatus.
		570—579	Railway Plant, Rolling Stock, etc.
		580—589	Machinery used in Preparing Agricultural Products.
		590—599	Aerial, Pneumatic, and Water Transportation. Machinery, and Apparatus, especially adapted to the requirements of the Exhibition.
AGRICULTURAL BUILDING.	VI. AGRICULTURE	600—609	Arboriculture and Forest Products.
		610—619	Pomology.
		620—629	Agricultural Products.
		630—639	Land Animals.
		640—649	Marine Animals, Fish Culture, and Apparatus.
		650—662	Animal and Vegetable Products.
		665—669	Textile Substances of Vegetable or Animal origin.
		670—679	Machines, Implements, and Processes of Manufacture.
		680—689	Agricultural Engineering and Administration.
		690—699	Tillage and General Management.
HORTICULTURAL BUILDING.	VII. HORTICULTURE.	700—709	Ornamental Trees, Shrubs, and Flowers.
		710—719	Hot Houses, Conservatories, Graperies.
		720—729	Garden Tools, Accessories of Gardening.
		730—739	Garden Designing, Construction, and Management.

The full text of the classification of the several Departments will be found at the commencement of the enumeration of objects shown in each. The distribution of the departments and buildings through the four volumes of the catalogue, is as follows:

VOLUME I.—DEPARTMENT I. *Mining and Metallurgy*. II. *Manufactures*; III. *Education and Science*. Main Building and Annexes.

VOLUME II.—DEPARTMENT IV. *Art*. Memorial Hall and Annexes.

VOLUME III.—DEPARTMENT V. *Machinery*. Machinery Building and Annexes. Buildings of United States government and foreign governments, of State governments, and of individual exhibitors.

VOLUME IV.—DEPARTMENT VI. *Agriculture*; VII. *Horticulture*. Agricultural and Horticultural Buildings and Annexes.

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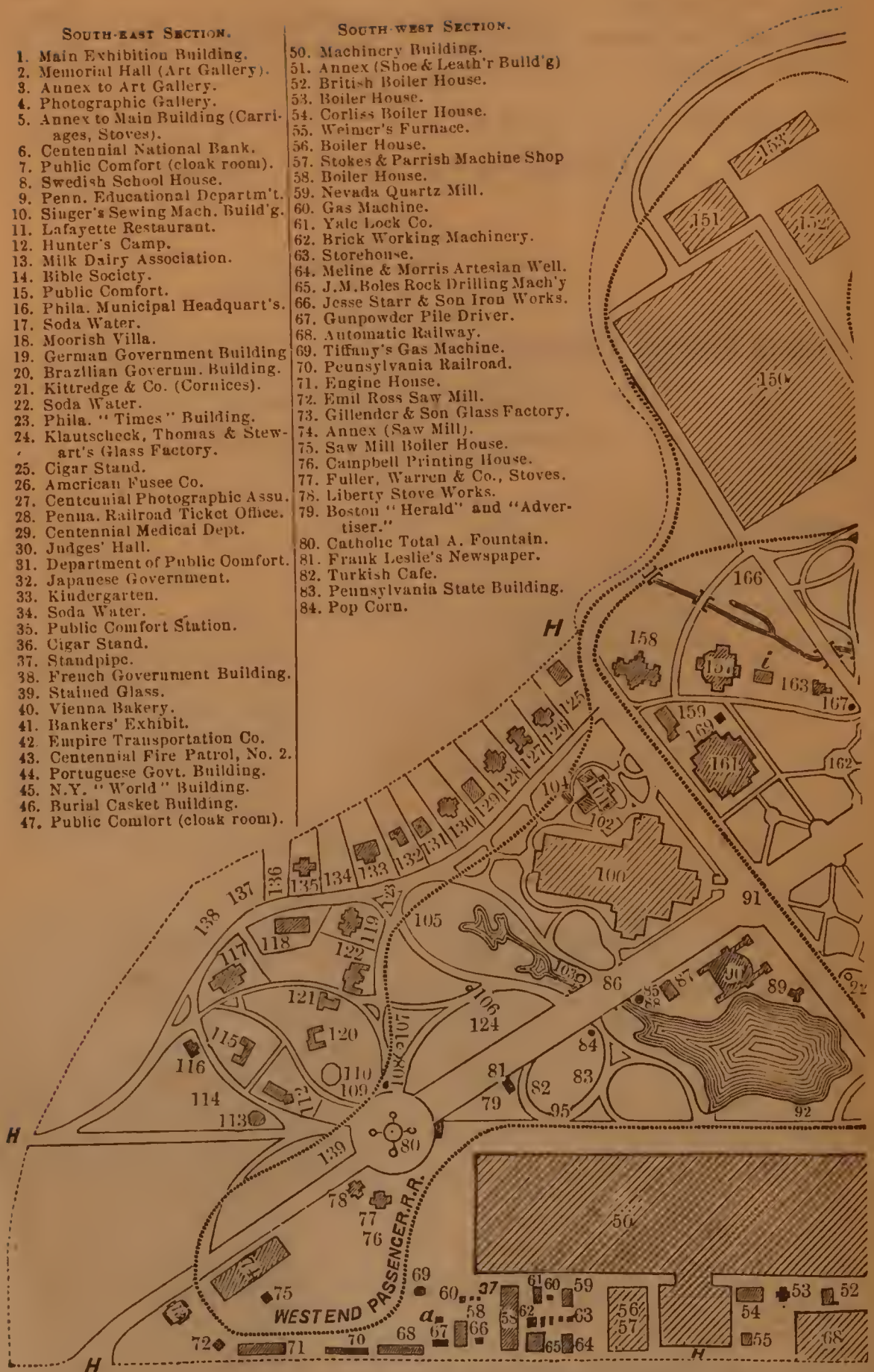
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SOUTH-EAST SECTION.

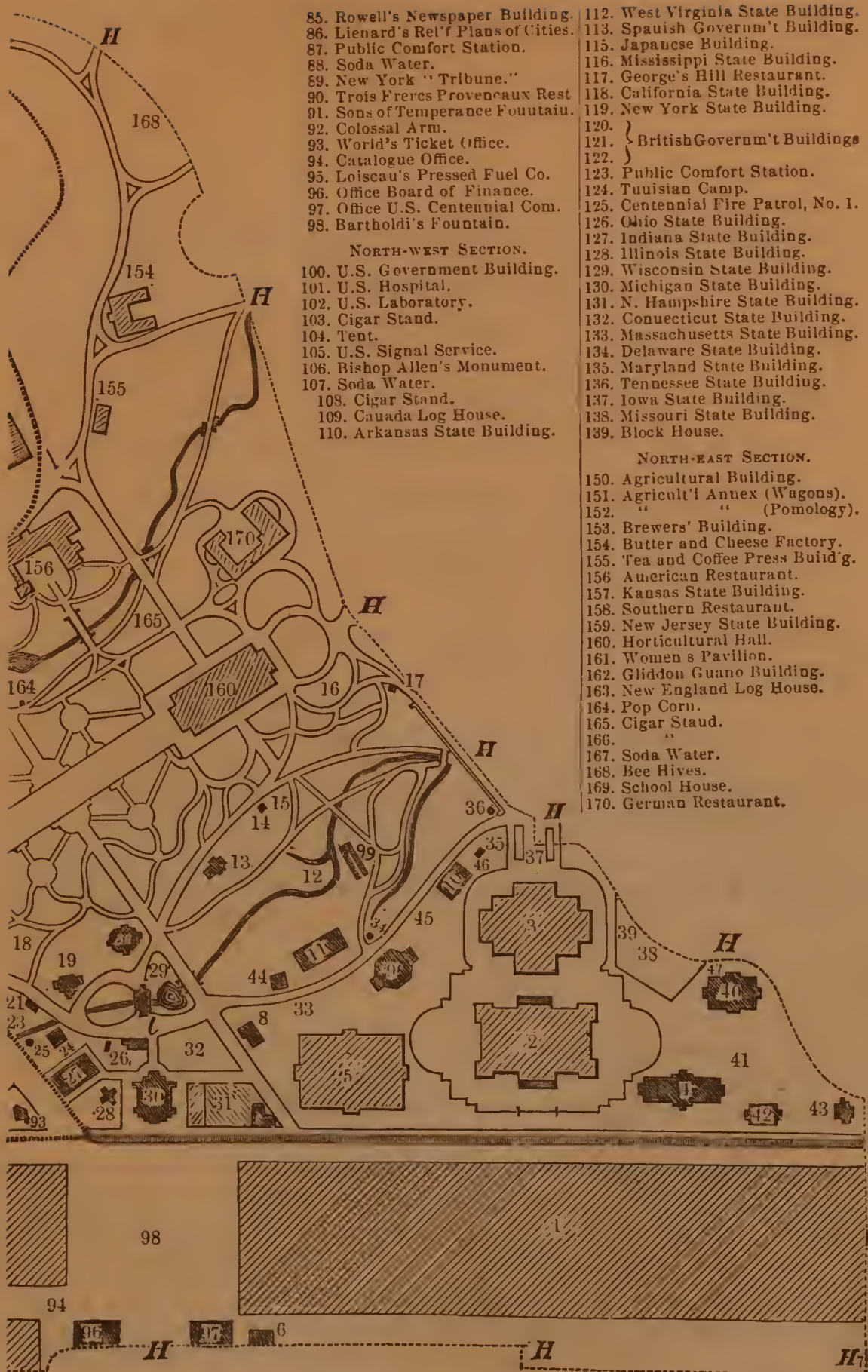
1. Main Exhibition Building.
2. Memorial Hall (Art Gallery).
3. Annex to Art Gallery.
4. Photographic Gallery.
5. Annex to Main Building (Carriages, Stoves).
6. Centennial National Bank.
7. Public Comfort (cloak room).
8. Swedish School House.
9. Penn. Educational Departm't.
10. Singer's Sewing Mach. Build'g.
11. Lafayette Restaurant.
12. Hunter's Camp.
13. Milk Dairy Association.
14. Bible Society.
15. Public Comfort.
16. Phila. Municipal Headquart's.
17. Soda Water.
18. Moorish Villa.
19. German Government Building.
20. Brazilian Governm. Building.
21. Kittredge & Co. (Cornices).
22. Soda Water.
23. Phila. "Times" Building.
24. Klautscheck, Thomas & Stewart's Glass Factory.
25. Cigar Stand.
26. American Fusee Co.
27. Centennial Photographic Assu.
28. Penna. Railroad Ticket Office.
29. Centennial Medical Dept.
30. Judges' Hall.
31. Department of Public Comfort.
32. Japanese Government.
33. Kindergarten.
34. Soda Water.
35. Public Comfort Station.
36. Cigar Stand.
37. Standpipe.
38. French Government Building.
39. Stained Glass.
40. Vienna Bakery.
41. Bankers' Exhibit.
42. Empire Transportation Co.
43. Centennial Fire Patrol, No. 2.
44. Portuguese Govt. Building.
45. N.Y. "World" Building.
46. Burial Casket Building.
47. Public Comfort (cloak room).

SOUTH-WEST SECTION.

50. Machinery Building.
51. Annex (Shoe & Leath'r Build'g)
52. British Boiler House.
53. Boiler House.
54. Corliss Boiler House.
55. Weimer's Furnace.
56. Boiler House.
57. Stokes & Parrish Machine Shop
58. Boiler House.
59. Nevada Quartz Mill.
60. Gas Machine.
61. Yale Lock Co.
62. Brick Working Machinery.
63. Storehouse.
64. Meline & Morris Artesian Well.
65. J.M. Boles Rock Drilling Mach'y
66. Jesse Starr & Son Iron Works.
67. Gunpowder Pile Driver.
68. Automatic Railway.
69. Tiffany's Gas Machine.
70. Pennsylvania Railroad.
71. Engine House.
72. Emil Ross Saw Mill.
73. Gillender & Son Glass Factory.
74. Annex (Saw Mill).
75. Saw Mill Boiler House.
76. Campbell Printing House.
77. Fuller, Warren & Co., Stoves.
78. Liberty Stove Works.
79. Boston "Herald" and "Advertiser."
80. Catholic Total A. Fountain.
81. Frank Leslie's Newspaper.
82. Turkish Cafe.
83. Pennsylvania State Building.
84. Pop Corn.



GROUND PLAN OF THE



INTERNATIONAL EXHIBITION.

THE MAIN EXHIBITION BUILDING. No. I.

Size, 1880 by 464 feet.

Engineers and Architects, HENRY PETTIT & JOS. M. WILSON.

Contractor, R. J. DOBBINS.

Wrought and Cast Iron Manufactured by WM. SELLERS & CO., *Moor Iron Works.*

Wrought Iron Furnished by A. & P. ROBERTS, *Pencoyd Rolling Mills.*

Cast Iron Furnished by MORRIS, TASKER, & CO., *Pascal Iron Works.*

Erector of Iron Work, WATSON MANUFACTURING CO.

THE Main Exhibition Building, containing Departments I, II, III of the Exhibition, is in the form of a parallelogram, extending east and west 1880 feet in length, and north and south 464 feet in width.

The larger portion of the structure is one story in height, and shows the main cornice upon the outside at 45 feet above the ground, the interior height being 70 feet. At the centre of the longer sides are projections 416 feet in length, and in the centre of the shorter sides or ends of the building are projections 216 feet in length. In these projections, in the centre of the four sides, are located the main entrances, which are provided with arcades upon the ground floor, and central facades extending to the height of 90 feet.

The East Entrance forms the principal approach for carriages, visitors being allowed to alight at the doors of the building under cover of the arcade. The South Entrance is the principal approach from street cars, the ticket offices being located upon the line of Elm Avenue, with covered ways provided for entrance into the building itself. The Main Portal on the north side communicates with the Art Gallery, and the Main Portal on the west side gives the main passage way to the Machinery and Agricultural Halls.

Upon the corners of the building there are four towers, 75 feet in height, and between the towers and the central projections or entrances there is a lower roof introduced, showing a cornice at 24 feet above the ground. In order to obtain a central feature for the building as a whole, the roof over the central part, for 184 feet square, has been raised above the surrounding portion, and four towers, 48 feet square, rising to 120 feet in height, have been introduced at the corners of the elevated roof.

The areas covered are as follows :

	SQUARE FEET.	ACRES.
Ground floor,	872,320	20.02
Upper floors in projections,	37,344	.85
“ “ in towers,	26,344	.60
	<hr/> 936,008	<hr/> 21.47

The general arrangement of the ground plan shows a central avenue or nave 120 feet in width, and extending 1832 feet in length. This is the longest avenue of that width ever introduced into an exhibition building. On either side of this nave there is an avenue 100 feet by 1832 feet in length. Between the nave and side avenues are aisles 48 feet wide, and on the outer sides of the building smaller aisles 24 feet in width. In order to break the great length of the roof lines, three cross avenues or transepts have been introduced of the same widths and in the same relative positions to each other as the nave and avenues running lengthwise, viz.: a central transept 120 feet in width by 416 feet in length, with one on either side of 100 feet by 416 feet, and aisles between of 48 feet. The intersections of these avenues and transepts in the central portion of the building result in dividing the ground floor into nine open spaces, free from supporting columns, and covering in the aggregate an area of 416 feet square. Four of these spaces are 100 feet square, four 100 feet by 120 feet, and the central space or pavilion 120 feet square. The intersections of the 48 feet aisles produce four interior courts 48 feet square, one at each corner of the central space. The main promenades through the nave and central transept are each 30 feet in width, and those through the centre of the side avenues and transepts 15 feet each. All other walks are 10 feet wide, and lead at either end to exit doors.

The following table gives the principal dimensions of the different parts of the building :

DIMENSIONS.

Measurements taken from centre to centre of supporting columns.

Length of building,	1880 feet
Width of building,	464 "

CENTRAL AVENUE OR NAVE.

Length,	1832 feet.
Width,	120 "
Height to top of supporting columns,	45 "
Height to ridge of roof, . .	70 "

CENTRAL TRANSEPT.

Length,	416 "
Width,	120 "
Height to top of columns, .	45 "
Height to ridge of roof, . .	70 "

SIDE AVENUES.

Length,	1832 "
Width,	100 "
Height to top of columns, .	45 "
Height to ridge of roof, . .	65 "

SIDE TRANSEPTS.

Length,	416 "
Width,	100 "
Height to top of columns, .	45 "
Height to ridge of roof, . .	65 "

CENTRAL AISLES.

Length at east end,	744 feet.
" at west end,	672 "
Width,	48 "
Height to roof,	30 "

SIDE AISLES.

Length at east end,	744 "
" at west end,	672 "
Width,	24 "
Height to roof,	24 "

CENTRE SPACE OR PAVILION.

Ground plan,	120 ft. sq.
Height to top of supporting columns,	72 "
Height to ridge of roof, . .	96 "

TOWERS OVER COURTS.

Ground plan,	48 "
Height to roof,	120 "

CORNER TOWERS.

Ground plan,	24 "
Height to roof,	75 "

The foundations consist of piers of masonry. The superstructure is composed of wrought iron columns, which support wrought iron roof trusses. These columns are composed of rolled channel bars, with plates riveted to the flanges. Lengthwise of the building the columns are spaced at the uniform distance apart of 24 feet. In the entire structure there are 672 columns, the shortest being 23 feet and the longest 125 feet in length. Their aggregate weight is 2,200,000 pounds. The roof trusses

are similar in form to those in general use for depots and warehouses, and consist of straight rafters with struts and tie-bars. The aggregate weight of iron in the roof trusses and girders is 5,000,000 pounds. This building being a temporary construction, the columns and trusses are so designed that they may be easily taken down and erected again at another site.

The sides of the building, for the height of seven feet from the ground, are finished with brickwork in panels between the columns; above the seven feet, with glazed sash. Portions of the sash are movable for ventilation. The roof covering is of tin upon sheathing boards. The ground flooring is of plank upon sills resting upon the ground, with no open space underneath.

The building stands nearly due east and west, and is lighted almost entirely by side light from the north and south sides. Louvre ventilators are introduced over the central nave and each of the avenues. Skylights are introduced over the central aisles.

Small balconies, or galleries of observation, have been provided in the four central towers of the building at the heights of the different stories.

A complete system of water supply, with ample provision of fire cocks, etc., is provided for protection against fire, and for sanitary purposes.

Offices for foreign commissions are placed along the sides of the building, in the side aisles, in proximity to the products exhibited.

The ground was graded and foundation laid for this building in the autumn of 1874. The erection of iron work at the site commenced on May 8th, 1875; the erection of the iron work was finished December 2d, 1875; and the building was accepted from the contractor February 14th, 1876. The cost of the building was \$1,580,000.

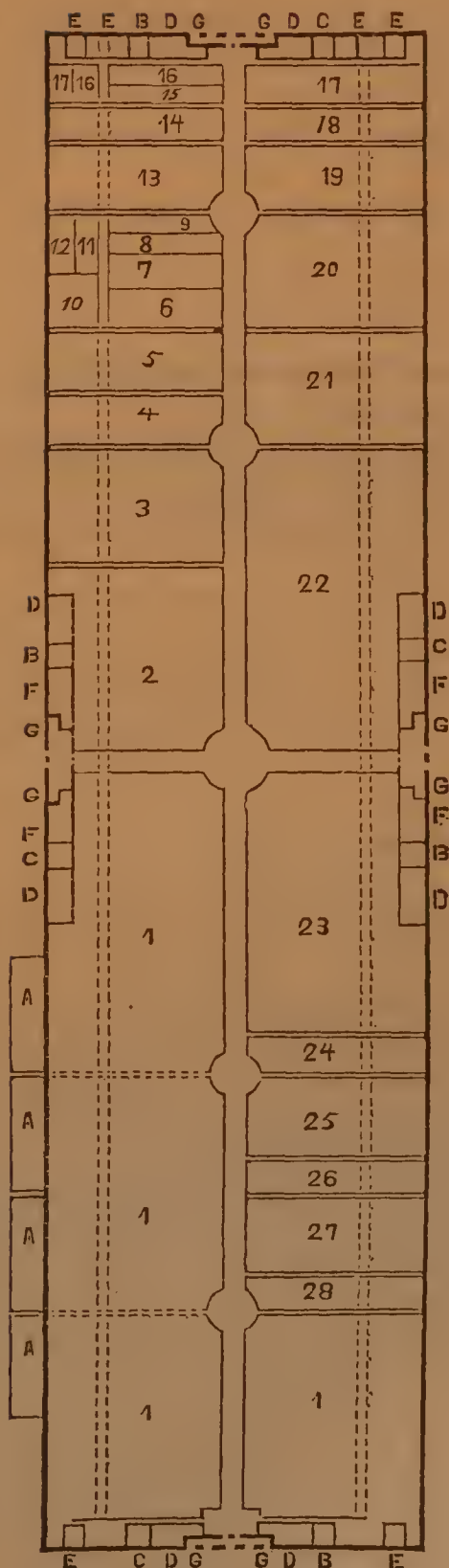
KEY TO THE NOTATION.

THE location of objects in the Main Building is shown by a letter and figure, indicating the nearest column of the building. The letters—A, B, C, to U—designate the successive ranges of columns, proceeding southward from the northern wall across the width of the building; the figures, the number of the column in each range, counting eastwardly from the western wall, the entire length of the building, from 1 to 79. Thus C 5 is the column in the third range from the north, and the fifth from the western end of the building. The southeasternmost column is U 79.

The class of the classification to which each exhibit belongs is indicated by the small figures at the end of the line.

MAIN EXHIBITION BUILDING.

Scale, 360 ft. to 1 in.



1. United States.
2. Germany.
3. Austria and Hungary.
4. Russia.
5. Spain.
6. Turkey.
7. Egypt.
8. Denmark.
9. Sweden.
10. Portugal.
11. Tunis.
12. Sandwich Islands.
13. Japan.
14. China.
15. Argentine Republic.
16. Chili.
17. Italy.
18. Norway.
19. Sweden.
20. Australasia, India, and other Colonies.
21. Canada.
22. Great Britain.
23. France and Colonies.
24. Switzerland.
25. Belgium.
26. Brazil.
27. Netherlands.
28. Mexico.

- A Mineral Annex.
 B Ladies' Room.
 C Gentlemen's Room.
 D Water-closets.
 E Offices.
 F Restaurants.
 G Stairway to Galleries.
 H Carriage House.

Total Length, 1880 ft. Width, 464 ft. Height, 70 ft.

CLASSIFICATION.

DEPARTMENT I.—MINING AND METALLURGY.

MINERALS, ORES, STONE, MINING PRODUCTS.

CLASS 100.—Minerals, ores, etc. Metallic and non-metallic minerals, exclusive of coal and oil. Collections of minerals systematically arranged; collections of ores and associated minerals; geological collections.

CLASS 101.—Mineral combustibles. Coal, anthracite, semi-bituminous, and bituminous, coal-waste and pressed coal; albertite, asphalt, and asphaltic limestone; bitumen, mineral tar, crude petroleum.

CLASS 102.—Building stones, marbles, slates, etc. Rough, hewn, sawn, or polished, for buildings, bridges, walls, or other constructions, or for interior decoration, or for furniture.

Marble—white, black, or colored—used in building, decoration, statuary, monuments, or furniture, in blocks or slabs not manufactured.

CLASS 103.—Lime, cement, and hydraulic cement, raw and burned, accompanied by specimens of the crude rock or material used, also artificial stone, concrete, beton.

Specimens of lime mortar and mixtures, with illustrations of the processes of mixing, etc. Hydraulic and other cement.

Beton mixtures and results, with illustrations of the processes.

Artificial stone for building purposes, building blocks, cornices, etc.

Artificial stone mixtures, for pavements, walls, or ceilings.

Plasters, mastics, etc.

CLASS 104.—Clays, kaolin, silex, and other materials for the manufacture of porcelain faience, and of glass, bricks, terra cotta and tiles, and fire brick. Refractory stones for lining furnaces, sandstone, steatite, etc., and refractory furnace materials.

CLASS 105.—Graphite, crude and refined; for polishing purposes; for lubricating, electrotyping, photography, pencils, etc.

CLASS 106.—Lithographic stones, hones, whetstones, grindstones, grinding and polishing materials, sand quartz, garnet, crude topaz, diamond, corundum, emery in the rock and pulverized, and in assorted sizes and grades.

CLASS 107.—Mineral waters, artesian well water, natural brines, saline and alkaline efflorescences and solutions. Mineral fertilizing substances, gypsum, phosphate of lime, marls, shells, coprolites, etc., not manufactured.

METALLURGICAL PRODUCTS.

CLASS 110.—Precious metals.

CLASS 111.—Iron and steel in the pig, ingot, and bar, plates and sheets, with specimens of slags, fluxes, residues, and products of working.

CLASS 112.—Copper in ingots, bars, and rolled, with specimens illustrating its various stages of production.

CLASS 113.—Lead, zinc, antimony, and other metals, the result of extractive processes.

CLASS 114.—Alloys used as materials, brass, nickel, silver, solder, etc.

MINING ENGINEERING—MODELS, MAPS, AND SECTIONS.

CLASS 120.—Surface and underground surveying and plotting. Projection of underground work, location of shafts, tunnels, etc. Surveys for aqueducts and for drainage.

Boring and drilling rocks, shafts, and tunnels, etc. Surveys for aqueducts, and for ascertaining the nature and extent of mineral deposits.

Construction. Sinking and lining shafts by various methods, driving and timbering tunnels, and the general operations of opening, stoping, and breaking down ore, timbering, lagging, and masonry.

Hoisting and delivering at the surface, rock, ore, or miners.

Pumping and draining by engines, buckets, or by adits.

Ventilation and lighting.

Subaqueous mining, blasting, etc.

Hydraulic mining, and the various processes and methods of sluicing and washing auriferous gravel and other superficial deposits.

Quarrying.

CLASS 121.—Models of mines, of veins, etc.

UNITED STATES.—STATISTICAL PREFACE.

THE United States of America occupy the entire width of the central portion of North America, between latitude $24^{\circ} 30'$ and 49° north, and from longitude $66^{\circ} 50'$ and $124^{\circ} 30'$ west. They are bounded, north, by New Brunswick, Canada (from which they are separated by the river St. Lawrence and the great lakes), and British Columbia; on the south, by Mexico and the Gulf of Mexico; east, by the Atlantic; and west, by the Pacific Ocean. Their greatest breadth, from Cape Cod, on the Atlantic, to the Pacific, near the parallel of latitude 42 degrees, is about 2600 miles. Their greatest length, from the northern boundary of Maine to Key West, in Florida, is about 1600 miles. Their mean length, from east to west, is about 1600 miles, and from north to south about 1300 miles. Their area, according to calculations founded on the report of the Commissioner of the General Land Office, for 1867, is 3,057,407 square miles, or 1,956,740,480 acres. This, however, is exclusive of the district of Alaska, in the extreme northwest of the continent, purchased from Russia, and comprising 577,390 square miles, or 369,529,600 acres. Including Alaska, the entire area of the United States and territories is 3,634,797 square miles.

Three mountain ranges, the Appalachian chain towards the east, the Rocky Mountains in the centre, and the Sierra Nevada in the west, divide the United States into four great regions. The first of these is the Atlantic slope, or all that portion lying east of the Appalachian or Alleghany range; the second, lying between the Appalachian and the Rocky Mountains, is known as the basin of the Mississippi and Missouri; the third is the country between the Rocky Mountains on the east and the Sierra Nevada on the west; the fourth extends from the Sierra Nevada to the Pacific Ocean, and is known as the Pacific slope.

The Appalachian or Alleghany mountains extend from the State of Mississippi northeast through the States of Alabama, Georgia, Tennessee, North Carolina, Virginia, Pennsylvania, New York, and Vermont, for about 1200 miles, at a variable distance of from 70 to 300 miles from the Atlantic coast, and with an average breadth of about 100 miles. Their mean height is from 2000 to 3000 feet, half of which consists in the elevation of the mountains over the adjacent plains, and the rest in the elevation of these plains above the sea. The White Mountains of New Hampshire, belonging to this chain, reach a height of 6226 feet, and the Black Mountain, of North Carolina, is 6732 feet above the level of the sea. The Rocky Mountains are a prolongation of the Mexican Cordillera, and some of their highest peaks attain to between 12,000 and 15,000 feet above the level of the sea. Their average altitude is about 8500 feet. The Sierra Nevada, or Snowy Mountains, are 10° to 12° west of the Rocky Mountains. Under different names, and with different altitudes, this range extends from the peninsula of lower California to Alaska, some of its passes being about 9000 feet, and its highest summits about 16,000 feet above the level of the sea.

The rivers of the United States are of great magnitude and importance. Of those flowing east and south the principal are the Mississippi and Missouri, which, with their tributaries, the Ohio, Arkansas, Red, Yellowstone, and Nebraska rivers, give to the interior an extent of inland navigation and a facility of communication unequalled on any other continent. Among the principal rivers flowing into the Atlantic, are the Hudson, Delaware, Susquehanna, Potomac, Savannah, and St. Johns. The Columbia, Sacramento, and Colorado flow into the Pacific Ocean. The Mississippi,

Alabama, Colorado (of Texas), and Rio Grande (the last named forming the boundary between Texas and Mexico), empty into the Gulf of Mexico. The area of the water-basins has been estimated as follows: Rivers flowing into the Pacific, 644,040 square miles; into the Atlantic, 488,877; into the Gulf of Mexico, 1,683,325 square miles, of which 1,257,457 are drained by the Mississippi-Missouri rivers. The coast-line on both oceans has a length of about 13,200 miles, excluding the numerous bays and sounds, besides 3600 miles on the great northern lakes.

The following table shows the area and population of each State and Territory:

STATES.	POPULATION IN 1870.	AREA IN SQUARE MILES.
Alabama,	996,992	50,722
Arkansas,	484,471	52,198
California,	560,247	188,981
Colorado,	39,864	104,000
Connecticut,	537,454	4,750
Delaware,	125,015	2,120
Florida,	187,748	58,268
Georgia,	1,184,109	58,000
Illinois,	2,539,891	55,410
Indiana,	1,680,637	33,809
Iowa,	1,194,020	55,045
Kansas,	364,399	81,318
Kentucky,	1,321,011	37,680
Louisiana,	726,915	41,346
Maine,	626,915	35,000
Maryland,	780,894	11,124
Massachusetts,	1,457,351	7,800
Michigan,	1,184,059	56,451
Minnesota,	439,706	83,531
Mississippi,	827,922	47,156
Missouri,	1,721,295	65,350
Nebraska,	122,993	75,995
Nevada,	42,491	104,125
New Hampshire,	318,300	9,280
New Jersey,	906,096	8,320
New York,	4,382,759	47,000
North Carolina,	1,071,361	50,704
Ohio,	2,665,260	39,964
Oregon,	90,923	95,274
Pennsylvania,	3,521,951	46,000
Rhode Island,	217,353	1,306
South Carolina,	705,606	34,000
Tennessee,	1,258,520	45,600
Texas,	818,579	274,356
Vermont,	330,551	10,212
Virginia,	1,225,163	38,348
West Virginia,	442,014	23,000
Wisconsin,	1,054,670	53,924
ORGANIZED TERRITORIES.		
Arizona,	9,658	113,916
Dakota,	14,181	150,932
District of Columbia,	131,700	64
Idaho,	14,999	86,294
Montana,	20,595	143,776
New Mexico,	91,874	121,291
Utah,	86,786	84,476
Washington,	23,955	69,994
Wyoming,	9,118	97,883
TERRITORIES NOT ORGANIZED.		
Alaska,		577,340
Indian,		68,991
Total,	38,558,351	3,602,424

In a country extending through 24° of latitude, and nearly 60 of longitude, the climate varies considerably. In the north, along the British frontier, the winter is very severe; during this season the snow is sufficiently abundant in New England to admit the use of sleighs, and the ice on the rivers strong enough to bear the passage of horses and wagons. As far south as Pennsylvania and New Jersey, the thermometer falls, in winter, below zero; rising, in summer, to nearly 100° Fahr. Along the Atlantic coast, between latitude 41° and 45° , the climate is colder in winter and warmer in summer, by nearly 10° , than in those parts of Europe which lie under the same parallels. Snow, however, rarely falls south of latitude 30° ; nor is it frequently seen south of the Potomac, except on mountains. The mean annual temperature of Albany is about 49° ; of New York and Cincinnati, about 51° ; of Philadelphia, 54° ; of Natchez, 65° , and of Cantonment Brooke, in Florida, 72° . The temperature along the Pacific is much higher than in corresponding latitudes on the eastern coast.

The Mississippi valley is very fertile. In the Eastern States there still exist large forests of valuable timber, such as beech, birch, maple, oak, pine, spruce, elm, ash, walnut; and, in the South, live-oak, water-oak, magnolia, palmetto, tulip tree, cypress, etc., remnants of the wooded region which formerly extended over the whole Atlantic slope, but into which great inroads have been made by advancing civilization. Apples, pears, cherries, and plums flourish in the North; peaches, melons, and grapes in the Middle States; pineapples, pomegranates, figs, almonds, and oranges in the South. Maize is grown from Maine to Louisiana, and wheat throughout the Union; tobacco as far north as Connecticut, and in the Western States south of Ohio. There is not much cotton raised north of 37° , though it grows as far north as 39° . Rice is cultivated in South Carolina, Georgia, Louisiana, and as far north as St. Louis, Mo. The sugar-cane grows as high as 33° , but does not thoroughly succeed beyond $31^{\circ} 30'$. The vine and mulberry tree grow in various parts of the Union; oats, rye, and barley throughout the North and the mountainous parts of the South; and hemp, flax, and hops in the Western and Middle States. The following figures, taken from the report of the ninth census (1870), will convey an idea of the extent of the annual productions of agriculture:

Spring wheat,	112,549,733 bushels
Winter wheat,	175,195,893 "
Rye,	16,918,795 "
Indian corn,	760,944,549 "
Oats,	282,107,157 "
Barley,	29,761,305 "
Buckwheat,	9,821,721 "
Rice,	73,635,021 pounds
Tobacco,	262,735,341 "
Cotton,	3,011,996 bales
Peas and beans,	5,746,027 bushels
Irish potatoes,	143,337,473 "
Sweet potatoes,	21,709,824 "
Wine,	3,092,369 gallons
Hay,	27,316,048 tons
Clover seed,	639,657 bushels
Grass seed,	583,188 "
Sugar (from cane),	87,043 hhds
Maple sugar,	28,443,645 pounds
Molasses,	23,564,469 gallons
Dairy Products.—Butter,	514,092,683 pounds
Cheese,	53,492,153 "
Milk sold,	235,500,599 gallons
Wool,	100,102,387 pounds
Wax,	631,129 "
Honey,	14,702,815 "

The same report gives the cash value of farms in the United States at \$9,262,803,861; of farming implements and machinery, at \$336,878,429; live stock, at \$1,525,276,457.

Total estimated value of all farm productions, including betterments and additions to stock, \$2,447,538,658. Value of orchard products, \$47,335,189; products of market gardening, \$26,719,229.

There were, at the same time, 8,690,219 horses, 28,074,582 cattle, 28,477,951 sheep, and 25,184,540 hogs.

Except a few small isolated fields, all the bituminous coal in the United States lies west of the Appalachian chain, where a vast series of coal beds stretch from the mountains west through Ohio, Indiana, and Illinois, parts of Kentucky and Alabama, into the State of Missouri, and as far as two hundred miles beyond the Mississippi. Anthracite coal is found most extensively in Pennsylvania; also in Western Virginia and the eastern portion of Ohio and Illinois. The oil-wells of northwestern Pennsylvania contain apparently inexhaustible stores of mineral oil or petroleum. Numerous salt-springs exist in New York, Virginia, Pennsylvania, and the Western States. Iron is distributed most abundantly through the coal measures in Pennsylvania, Ohio, Virginia, and Tennessee, the ore containing from 25 to 33 per cent. of metal. Iron ore also abounds in the Northwestern States; and that found in one part of Vermont yields 78 per cent. of iron. A large proportion of the ore found in this part of the Union is magnetic. Lead is found in various places, but more especially in Missouri, Wisconsin, and Illinois. In some parts of Wisconsin this ore yields from 60 to 70 per cent. of lead. Large deposits of copper have been found in Michigan, in the Lake Superior region. Gold, in large quantities, and silver, have been found in the States and Territories west of the Rocky Mountains. Gold has also been found in Virginia, the Carolinas, Georgia, and Tennessee. Quicksilver, zinc, manganese, with lime and building stone, are the other chief mineral products. The following figures are from the Statistics of Mining, Table VIII, Report of the Ninth Census (1870):

	VALUE OF PRODUCTS.
Anthracite coal,	\$38,495,745
Bituminous coal,	35,029,247
Copper,	5,201,312
Gold, placer mined,	7,266,613
" hydraulic mined,	2,508,531
Quartz, gold and silver bearing,	16,677,508
Iron ore,	13,204,138
Lead,	736,004
Petroleum,	19,304,224

The mechanical and manufacturing establishments of the Union, in 1870, numbered 252,148, using steam-engines of 1,215,711 horse-power and 1,130,431 horse-power in water-wheels, and employing 2,053,996 hands. The amount of capital invested is \$2,118,208,769; annual wages, \$775,584,343; material used, \$2,488,427,242, and the total products \$4,232,325,442. The chief manufacturing States are Pennsylvania, New York, Massachusetts, Ohio, Illinois, New Jersey, Connecticut, and Rhode Island.

The importations for the year ending June 30th, 1875, were:

Merehandise,	\$533,005,536
Gold and silver,	20,894,217
Total,	<u>\$553,899,753</u>
Foreign exports, merchandise,	\$14,157,611
Gold and silver,	8,275,013
Total,	<u>\$22,432,624</u>

The gold value of domestic exports, during the same period, was \$583,141,229.

In the length of miles of railway open to traffic, the United States exceeds all other nations, although in the proportion of miles of railway to miles of area, it ranks below some of the smaller and more densely populated states of Europe. The following figures, from Poor's "Railway Manual," illustrate the growth of the railway system in the United States :

In 1830, there were	23 miles in operation.
" 1840, " "	2,818 " " "
" 1850, " "	9,021 " " "
" 1860, " "	30,635 " " "
" 1870, " "	52,898 " " "
" 1874, " "	72,623 " " "

During the year 1874, the gross earnings were \$520,466,016, of which \$379,466,935 was for freight, and \$140,999,081 for passengers. Net earnings, \$189,570,958; dividends paid, \$67,042,942.

The government of the United States is, by the Constitution, intrusted to three separate authorities, the executive, the legislative, and the judicial. The executive power is vested in a President, who is elected every four years, and is eligible for re-election. The legislative power is vested in two houses, the Senate and the House of Representatives, the President having a veto power, which may be overcome by a two-thirds vote of both houses. Two senators from each State are elected by the legislature thereof, for the term of six years; and representatives are chosen in each State, by popular vote, for two years. The number of Representatives for each State is allotted in proportion to its population, one for each 135,239.

The supreme judicial authority is vested in a Chief Justice and eight Associate Justices, who are appointed for life by the President, by and with the consent of the Senate.

The government of each State is on the same model as that of the general government. There is a governor chosen by popular vote, and a State legislature, similarly chosen, composed of two houses. Each State also has a constitution which prescribes its form of government.

The following statistics apply to the army and navy of the United States in 1875: The army consisted, July 1st, 1875, of 2204 commissioned officers, and 25,000 enlisted men; the navy of 175 vessels, with an armament of 1282 guns, 8500 men, 1254 commissioned, and 490 non-commissioned officers on the active list.

The postal service is conducted by the general government. During the fiscal year ending June 30th, 1875, it carried 601,921,520 letters, 117,215,850 stamped wrappers, 13,956,750 newspapers, and 31,094,500 postal cards. The money orders amounted to \$75,425,854.

The telegraph lines belong to private corporations. Their total length, in January, 1875, was 75,000 miles; length of wires, 165,000 miles; number of offices, 6172; number of messages transmitted during the year 1874, 13,700,000.

Education is conducted by the separate States. In general the primary schools are supported by a property tax, and nearly all the States have school funds in addition, the income of which is distributed among the towns in proportion to the number of pupils educated. The gifts with which, during late years, private individuals have endowed institutions of learning, prove a growing appreciation of the claims of the higher education.

The following statistics are collated from the report of the ninth census, 1870:

PUBLIC SCHOOLS.

NUMBER OF SCHOOLS.	TEACHERS EMPLOYED.			PUPILS IN ATTENDANCE.		
	MALE.	FEMALE.	TOTAL.	MALE.	FEMALE.	TOTAL.
125,059	74,174	109,024	183,198	3,120,052	3,108,008	6,228,060

The schools "Not Public" are arranged under two headings: "Classical, Professional, and Technical," and "Other Schools."

"NOT PUBLIC" SCHOOLS (Classical, Professional, and Technical).

NUMBER.	TEACHERS.			PUPILS.		
	MALE.	FEMALE.	TOTAL.	MALE.	FEMALE.	TOTAL.
Classical, etc., 2,545	7,766	5,001	12,767	148,810	106,380	255,190
Other Schools, 14,025	11,389	13,688	25,077	353,134	373,554	726,688

INCOME.

PUBLIC.	NOT PUBLIC.	
	CLASSICAL, PROFESSIONAL, AND TECHNICAL.	OTHERS.
From Taxation of Public Funds,	\$58,855,507	\$2,320,250
" Endowments,	144,533	3,356,003
" Other Sources, including Tuition,	5,030,633	11,999,654
	\$64,030,673	\$17,675,907
		\$13,696,146

The total number of libraries returned was 163,353, containing 44,539,184 volumes. Of these, 107,673 were private libraries, containing 25,571,503 volumes. In the opinion of the superintendent of the census, these results are "manifestly far below the truth."

The newspaper and periodical press comprised, in 1875, 7870 publications, divided as follows: Daily, 1718; tri-weekly, 80; semi-weekly, 107; weekly, 5957; bi-weekly, 24; semi-monthly, 106; monthly, 802; bi-monthly, 8; quarterly, 68.

"STAR" ALPACA BRAIDS.

S. B. & M. FLEISHER,
MANUFACTURERS, PHILADELPHIA.



WHY ARE THEY THE BEST?

ANSWER:

As a strong and conclusive evidence of the superior quality of the "STAR" ALPACA BRAIDS, is the preference that is given them over all competitive makes.

Having been subjected to rigid tests for the past ten years, and wherever introduced, they at once became the desired article.

They are made of the very best materials, with the greatest care and efficient workmanship, and upon the most improved machinery.

With these appliances, and a determination to go ahead, the manufacturers have made the "STAR" Alpaca Braids the most popular Braid of the country.

First Prize, Silver Medal, Franklin Institute, Philada., 1874.
First Prize, Silver Medal, Maryland Institute, Baltimore, 1874.
First Prize, Silver Medal, Industrial Exposition, Cinn., 1875.

For Sewing Machines and Hand Sewing USE

STRONG, SMOOTHE,
AND ELASTIC.



SIX COORD in all Nos.
from 8 to 100.

(WOUND ON WHITE SPOOLS.)

GEORGE A. CLARK, SOLE AGENT.
IT IS

The Best and Most Popular Thread of the age.

GEORGE A. CLARK & BRO.,

SOLE AGENTS IN AMERICA,

Nos. 337 and 339 Canal Street, New York.

Sub-agency, 8 Strawberry St., Philadelphia.

CHENEY BROTHERS,

Silk Manufacturers,

Mills at Hartford & South Manchester

CONNECTICUT.

SALESROOMS, { **477 BROOME ST., NEW YORK,**
19 FRANKLIN ST., BOSTON.

GROS GRAIN DRESS SILKS in Black and Colors of all Shades.

FIGURED AND TWILLED SILKS for the Millinery Trade.

FLORENTINES AND MARCELLINES, of all colors, qualities, and widths, for the use of Manufacturers of Parasols, Hats, Caps, and Furs.

SILK HANDKERCHIEFS AND MUFFLERS, Plain or with Woven or Printed Borders.

SILK FLAGS of various sizes, from 7 x 10 to 30 x 48 inches, hemmed and boxed in dozens for the trade.

BONNET RIBBONS, Black and Colored, of all widths and shades.

SASH AND BELT RIBBONS.

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ORGANZINES, TRAMS, AND FINE PATENT SPUN SILKS, for Silk Mixture, Cassimeres, and for all other fabrics in which Silk is used.

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Specimens of all the above-mentioned fabrics and threads can be seen in the show-case of **Cheney Brothers**, in the American Silk Department of the Centennial Exhibition in the Main Building.

UNITED STATES.

Minerals, Ores, Stone, Mining Products.

Minerals, Ores, Stone, Mining Products.

- 1 Cambria Iron and Steel Co., Johnstown, Pa.** T 65.
- a* Carbonate, fossil, and hematite ores from Johnstown, Frankstown, Marklesburg, Yellow Creek, Levant, Henrietta, and Springfield mines; specular, magnetic, red hematite, Lake Superior, and Lake Champlain ores; manganiferous Iron Mountain ores. 100
- b* B, C, D, and E, coal from Johnstown and Bennington mines; Belgian, pit, and oven coke. 101
- c* Lime flux from Birmingham, Hollidaysburg, Henrietta, and Ganister mines. 103
- 2 Wharton, Joseph, Camden, N. J.**—Nickel ores. T 63. 100
- 3 Sharswood, Wm., Philadelphia, Pa.**—Suite of minerals and salts, illustrating the chemistry and mineralogy of cerium, lanthanum, and didymium. T 71. 100
- 4 Hatch, John, San Francisco, Cal.**—Minerals of the Pacific states and territories, Mexico, Central and South America, China, Japan, etc. T 67. 100
- 5 Barton, Chas., Philadelphia, Pa.**—Ores from "Blazing Star" silver mine, Colorado. T 71. 100
- 6 Adams, J. Howe, Philadelphia, Pa.**—Ore from "Blue Jacket" silver mine, Montana district, Colorado. T 71. 100
- 7 Benton, Caroline C., Philadelphia, Pa.**—Iron ores from St. Lawrence and Lewis counties, N. Y. T 71. 100
- 8 Foote, A. E., Philadelphia, Pa.**—Collection of minerals; elementary collection of minerals for students. T 71. 100
- 9 Cleveland Rolling Mill Co., Cleveland, Ohio.**—Ores. T 60. 100
- 10 Holland, James M., Denver, Col.**—Ores of gold, silver, lead, and tellurium, mined in Colorado. T 69. 100
- 11 Wyoming Historical and Geological Society, Wilkesbarre, Pa.**—Fossils from the anthracite coal measures of Wyoming Valley, Pa. T 70. 100
- 12 Cook, Isaac, St. Louis, Mo.**—Lead ores from Washington county, Mo. T 68. 100
- 13 Port Henry Iron Ore Co., New York, N. Y.**—Magnetic iron ores. T 71. 100
- 14 Witherbee, Sherman, & Co., Port Henry, N. Y.**—Magnetic iron ore. T 71. 100
- 15 Black Band Iron Co., Marietta, Ohio.**—Black band, red hematite, and other iron ores. V 63. 100
- 16 Brown & Co., Wayne Iron and Steel Works, Pittsburgh, Pa.**—Ores. T 62. 100
- 17 Lucy Furnace Co., Pittsburgh, Pa.**—Iron ores. T 66. 100
- 18 Providence Franklin Society, Providence, R. I.**—Minerals and geological specimens from Rhode Island. T 70. 100
- 19 Blanchard & Lippitt, Hartford, Conn.**—Brown hematite iron ore from Lakeville, Conn. T 70. 100
- 20 Hussey & Howe Mining Co., Plattsburgh, N. Y.**—Blue magnetic iron ore (martite); black magnetic iron ore. T 69. 100
- 21 Alexander, John S., Philadelphia, Pa.**—Collection of minerals. T 70. 100
- 22 Passaic Zinc Co., Passaic, N. J.**—Zinc ores. T 63. 100
- 23 Magnetic Iron Co., Philadelphia, Pa.**—Bessemer ores; minerals from Carter county, Tenn. T 69. 100
- 24 Crab Orchard Iron Co., Philadelphia, Pa.**—Magnetic Bessemer iron ores from Crab Orchard, Tenn. T 69. 100
- 25 Herr, Jos. C., Philadelphia, Pa.**—Hematite iron ores, manganese, and baryta from French Broad River, Cocke county, Tenn. T 69. 100
- 26 Davis, O. W., jr., Bangor, Maine.**—Katahdin ores (limonite). T 69. 100
- 27 Thomas Iron Co., Hokendauqua, Pa.**—Iron ore. T 64. 100
- 28 Lehigh Zinc Co., Bethlehem, Pa.**—Zinc ores and minerals from zinc mines. T 64. 100
- 29 Russell, Jesse, Boston, Mass.**—Iron ore. T 68. 100
- 30 Stockbridge Iron Co., New Bedford, Mass.**—Iron ore from West Stockbridge and Richmond, Mass. T 70. 100
- 31 Dexter & Co., New York, N. Y.**—Mica from North Carolina. T 72. 100
- 32 Murrey Mining Co., Detroit, Mich.**—Native copper, etc. V 67. 100
- 33 Shalter, R. M., Carrick Furnace, Franklin county, Pa.**—Iron ore. T 63. 100
- 34 Shelley Iron Co., Shelley Iron Works, Ala.**—Iron ores. T 71. 100
- 35 Rockhill Iron and Coal Co., Philadelphia, Pa.**—Iron ores. T 72. 100
- 36 Tecumseh Iron Co., Tecumseh, Ala.**—Iron ore. T 70. 100
- 37 New River Railroad, Mining, and Manufacturing Co. of Virginia, Philadelphia, Pa.**—Iron ores and other minerals. T 50. 100

Minerals, Ores, Stone, Mining Products.

- 38 Lackawanna Iron and Coal Co., Scranton, Pa.—Iron ores. T 64. 100
- 39 Lee, Alfred S., Richmond, Va.—Manganese and iron ore and pure silica from Amherst county, Va. T 64. 100
- 40 Lake Superior Iron Co., Marquette county, Mich.—Iron ore. T 70. 100
- 41 Kentucky Geological Survey.—Collection illustrating the geology and mineral resources of Kentucky. V 70. 100
- 42 Allen, Oliver, Mumford, N. Y.—Petritified wood, leaves, ferns, etc., found on his premises. T 72. 100
- 43 Vesuvius Furnace, Etna Iron Works, Ironton, Ohio.—Iron ore. T 68. 100
- 44 Etna Furnace, Etna Iron Co., Hanging Rock, Ohio.—Iron ore. T 68. 100
- 45 Blanche Furnace, Etna Iron Works, Ironton, Ohio.—Iron ores. T 68. 100
- 46 Hecla Iron and Mining Co., Ironton, Ohio.—Iron ores. T 68. 100
- 47 Monitor Furnace Co., Ironton, Ohio.—Iron ores. T 68. 100
- 48 Grant Furnace, W. D. Kelley & Sons, Ironton, Ohio.—Iron ores. T 68. 100
- 49 Center Furnace, W. D. Kelley & Sons, Ironton, Ohio.—Iron ores. T 68. 100
- 50 Howard Furnace, Charcoal Iron Co., Ironton, Ohio.—Iron ores. T 68. 100
- 51 Buckhora Furnace, Charcoal Iron Co., Ironton, Ohio.—Iron ores. T 68. 100
- 52 Olive Furnace, Campbell, McGugin, & Co., Ironton, Ohio.—Iron ores. T 68. 100
- 53 Lawrence Furnace Co., Ironton, Ohio.—Iron ores. T 68. 100
- 54 Pine Grove Furnace, Means, Kyle, & Co., Hanging Rock, Ohio.—Iron ores. T 68. 100
- 55 Ohio Furnace, Means, Kyle, & Co., Hanging Rock, Ohio.—Iron ores. T 68. 100
- 56 Washington Furnace, Union Iron Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 57 Scioto Furnace, L. C. Robinson & Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 58 Bloom Furnace, John Paul & Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 59 Clinton Furnace, W. I. Bell, Wheelersburg, Ohio.—Iron ores. T 68. 100
- 60 Buckeye Furnace Co., Jackson, Ohio.—Iron ores. T 68. 100
- 61 Cambria Furnace, D. Lewis & Co., Samsonville, Ohio.—Iron ores. T 68. 100
- 62 Jackson Furnace, L. P. N. Smith's Heirs, Sciotoville, Ohio.—Iron ores. T 68. 100
- 63 Jefferson Furnace Co., Oak Hill, Ohio.—Iron ores. T 68. 100
- 64 Orange Furnace, Orange Iron Co., Jackson, Ohio.—Iron ores. T 68. 100
- 65 Star Furnace Co., Jackson, Ohio.—Iron ores. T 68. 100
- 66 Huron Furnace, Huron Iron Co., Jackson, Ohio.—Iron ores. T 68. 100
- 67 Tropic Furnace Co., Jackson, Ohio.—Iron ores. T 68. 100
- 68 Globe Furnace, Globe Iron Co., Jackson, Ohio.—Iron ores. T 68. 100
- 69 Fulton Furnace, Globe Iron Co., Jackson, Ohio.—Iron ores. T 68. 100
- 70 Wellston Twin Furnaces, Wellston Coal and Iron Co., Wellston, Ohio.—Iron ores. T 68. 100
- 71 Lincoln Furnace, I. M. McGhee's Estate, Rud's Mills, Ohio.—Iron ores. T 68. 100
- 72 Richland Furnace Co., Richland P. O., Ohio.—Iron ores. T 68. 100
- 73 Eagle Furnace, L. C. Damarin, & Co., Rud's Mills, Ohio.—Iron ores. T 68. 100
- 74 Hope Furnace, L. C. Damarin & Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 75 Hamden Furnace, L. C. Damarin & Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 76 Vinton Furnace, Bancroft, Rader, & Co., Vinton Station, Ohio.—Iron ores. 100
- 77 Keystone Furnace Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 78 Monroe Furnace, Union Iron Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 79 Latrobe Furnace, Bundy & Cobb, Berlin Cross Roads, Ohio.—Iron ores. T 68. 100
- 80 Logan Furnace Co., Logan county, Ohio.—Iron ores. T 68. 100
- 81 Union Furnace, Brooks & Hueston, Haydensville, Ohio.—Iron ores. T 68. 100
- 82 Mount Savage Furnace, Lexington and Carter county Mining and Manufacturing Co., Lexington, Ky.—Iron ores. T 68. 100
- 83 Buffalo Furnace, Culbertson, Earhart, & Co., Greenupsburg, Ky.—Iron ores. T 68. 100
- 84 Hunnewell Furnace, Eastern Kentucky Railway Co., Riverton, Ky.—Iron ores. T 68. 100
- 85 Pennsylvania Furnace, Eastern Kentucky Railway Co., Riverton, Ky.—Iron ores. T 68. 100
- 86 Charlotte Furnace Co., Riverton, Ky.—Iron ores. T 68. 100
- 87 Laurel Furnace, Robt. Scott & Co., Riverton, Ky.—Iron ores. T 68. 100
- 88 Gallia Furnace, Norton, Campbell, & Co., Portsmouth, Ohio.—Iron ores. T 68. 100
- 89 Raccoon Furnace, Raccoon Mining and Manufacturing Co., Riverton, Ky.—Iron ores. T 68. 100
- 90 Tygert's Valley Mining Co., Riverton, Ky.—Section of iron ore. T 68. 100
- 91 Bellefonte Furnace, Means, Russell, & Means, Ashland, Ky.—Iron ores. T 68. 100
- 92 Buenavista Furnace, Means & Co., Ashland, Ky.—Iron ores. T 68. 100
- 93 Trigg Furnace, D. Hillman & Sons, Empire Iron Works, Ky.—Iron ores. T 68. 100
- 94 Center Furnace, D. Hillman & Sons, Empire Iron Works, Ky.—Iron ores. T 68. 100
- 95 Shaw, Thomas Ogg, Providence, R. I.—Mineral from Wyoming Territory. T 50. 100
- 96 Hanging Rock Iron Region, Ironton, Ohio.—Iron ores. T 68. 100

Minerals, Ores, Stone, Mining Products.

- 97 Traber & Aubery, Cincinnati, Ohio.
—Iron ores from twenty-five states and territories. T 68. 100
- 98 State of Alabama.—Specimens of the minerals of the State. V 55. 100
- 99 Cooper, Hewitt, & Co., New York, N. Y. T 66.
a Iron ores. 100
b Fuels. 101
- 100 Ohio Coal Co., Marietta, Ohio.
V 63.
a Coal. 100
b Coke. 101
- 101 Rhodes & Co., Cleveland, Ohio. T 71.
a Lake Superior iron ores. 100
b Massillon Ohio coals. 101
- 102 Poplar Creek Mineral Railroad Co., Philadelphia, Pa. T 69.
a Iron ores, etc., from Anderson county, Tenn. 100
b Coal from Anderson county, Tenn. 101
- 103 Durham Iron Co., Riegelsville, Pa. T 64.
a Ores. 100
b Fuel. 101
- 104 Glendon Iron Co., Easton, Pa. T 64.
a Iron ores. 100
b Fuel. 101
- 105 Uhler, Peter, Easton, Pa. T 64.
a Ores. 100
b Fuel. 101
- 106 Keystone Iron Co., Easton, Pa. T 64.
a Ores. 100
b Fuel. 101
- 107 Northampton Furnace, worked by the Bethlehem Iron Co., Bethlehem, Pa. T 64.
a Iron ores. 100
b Fuel. 101
- 108 Lehigh Iron Co., Allentown, Pa. T 64.
a Iron ore. 100
b Coal. 101
- 109 Emaus Iron Co., Allentown, Pa. T 64.
a Iron ore. 100
b Fuel. 101
- 110 Millerstown Iron Co., Allentown, Pa. T 64.
a Iron ore. 100
b Fuel. 101
- 111 Allentown Rolling Mill Co., Allentown, Pa. T 64.
a Ores. 100
b Fuel. 101
- 112 Carbon Iron Co., Parryville, Pa. T 64.
a Iron ore. 100
b Fuel. 101
- 113 Philadelphia and Reading Coal and Iron Co., Philadelphia, Pa. T 72.
a Iron ores. 100
b Coals for smelting and steam purposes. 101
- 114 Grand Tower Mining, Manufacturing, and Transportation Co., Grand Tower, Ill. T 68.
a Ores. 100
b Fuel. 101
- 115 Ironton Furnace Iron and Steel Co., Ironton, Ohio. T 68.
a Iron ores. 100
b Bituminous coal. 101
- 116 Belfont Furnace, Belfont Iron Works, Ironton, Ohio. T 68.
a Iron ores. 100
b Bituminous coals. 101
- 117 Ophir Furnace Co., Jackson, Ohio. T 68.
a Iron ores. 100
b Jackson county stone coal. 101
- 118 Norton Iron Works, Ashland, Ky. T 68.
a Iron ores. 100
b Coals and coke. 101
- 119 Ashland Furnace, Lexington and Big Sandy Railroad Co., Ashland, Ky. T 68.
a Iron ores. 100
b Coals. 101
- 120 Powel, Robert Hare, & Co., Philadelphia, Pa. X 67.
a Iron ore from Huntingdon county, Pa. 100
b Semi-bituminous coal from Powelton mines. 101
- 121 Union Iron Co. of Buffalo, Buffalo, N. Y. T 64.
a Iron ores. 100
b Limestone. 103
- 122 Woodstock Iron Co., Anniston, Ala. T 63.
a Iron and manganese ores. 100
b Limestone. 103
- 123 Sancon Iron Co., Hellertown, Pa. T 64.
a Hematite and magnetic ore. 100
b Limestone. 103
- 124 Andrews, Hitchcock, & Co., Cleveland, Ohio. V 61 to 64.
a Lake Superior iron ores. 100
b Brier Hill coal. 101
c Limestone. 103
- 125 Duncan, John W., Philadelphia, Pa. T 72.
a Iron ores. 100
b Clays. 104
- 126 Penn Steel and Iron Co., Clintonville, N. Y. T 63.
a Iron ore. 100
b Graphite ore. 105
- 127 Thomas, W. H. B., Mount Holly, N. J. T 71.
a Minerals. 100
b Marls for fertilizing purposes; mineral waters from New Jersey. 107
- 128 Myers, A. J., Shenandoah Alum Springs, Va. T 67.
a Minerals, ores. 100
b Mineral spring waters, chalybeate, iron, and sulphur waters. 107
- 129 Crane Iron Co., Catasauqua, Pa. T 64.
a Hematite and magnetic iron ores. 100
b Fuel. 101
c Limestone. 103
- 130 Carter, W. T., & Co., Redington, Pa. T 64.
a Iron ores. 100
b Coal. 101
c Limestone. 103
- 131 Lehigh Valley Iron Co., Copley, Pa. T 64.
a Hematite and magnetic ore. 100
b Fuel. 101
c Limestone. 103
- 132 Riverside Iron Works, Wheeling, W. Va. T 64.
a Iron ore. 100
b Coke. 101
c Limestone. 103

Minerals, Ores, Stone, Mining Products.

- 133 Alice Furnace, Etna Iron Works,**
Hanging Rock, Ohio. T 68.
a Iron ores. 100
b Bituminous coal and coke. 101
c Limestone. 103
- 134 Hanging Rock Iron Region Furnaces,** Charles Campbell, Commissioner, Ironton, Ohio. T 69.
a Iron ores. 100
b Cinders, bituminous coals. 101
c Limestone. 103
d Fire clay. 104
- 135 Tuscarawas Coal and Iron Co.,** Cleveland, Ohio. T 71.
a Iron ores. 100
b Coal. 101
c Limestone. 103
d Sand, fire clay. 104
- 136 Mount Vernon Furnace, Hiram** Campbell & Sons, Ironton, Ohio. T 68.
a Iron ores. 100
b Bituminous coals. 101
c Limestone. 103
d Fire clay. 104
- 137 Milton Furnace and Coal Co.,** Wellston, Ohio. T 68.
a Iron ores. 100
b Coals. 101
c Limestone. 103
d Fire clay. 104
- 138 Keim, Beverley R., Kansas City,** Kansas. B 67.
a Minerals, fossils, and petrifications from line of Kansas Pacific Railroad. 100
b Birds from line of Kansas Pacific Railroad. 635
c Animals from line of Kansas Pacific Railroad. 637
- 139 State of Wisconsin.** V 60.
a Minerals, soils, etc. 100
b Building stone. 102
c Sands, gravel. 104
- 140 State of Ohio (by F. W. Green).** W 63.
a Minerals, ores. 100
b Stone. 102
c Clay, etc. 104
- 141 State of New Jersey (by Geo. H.** Cook, State Geologist, New Brunswick, N. J.). T 70.
a Iron, zinc, and copper ores; minerals, geological suite. 100
b Building stones. 102
c Clays and sands. 104
d Fertilizers. 107
- 142 State of Indiana (by E. T. Cox,** State Geologist). V 57.
a Hydrated brown oxide iron ores. 100
b Bituminous and cannel coal from various mines. 101
c Marble of various colors, oölitic building stone, limestone, sandstone, limestone flags, hydraulic stone. 102
d Hydraulic cement, caustic lime. 103
e Fire, white porcelain, and potters' clay; sand. 104
- 143 State of Michigan (Jay A. Hubbell,** Houghton, Mich., Superintendent of Mineral Department). V 67.
a Minerals, ores, geological collections, etc. 100
b Bituminous and cannel coal. 101
c Hewn, sawed, and polished building stone, marbles, and slates. 102
d Lime and cement. 103
e Clays and silex for glass manufacturers; sandstone, etc. 104
f Mineral waters, natural brines, gypsum, marls, etc. 107
- 144 State of Delaware (by J. P.** Coniegys, Dover, Del.). W 65.
a Iron ore. 100
b Building stone. 102
c Clays. 104
d Natural woods. 600
e Fruits. 610
f Cereals. 620
g Peas, beans, potatoes, turnips. 621
- 145 State of Missouri (collective ex-**hibit, by Thos. Allen, President State Board Centennial Managers, St. Louis, Mo.). V 65.
a Iron, lead, zinc, copper, and nickel ores, barytes, feldspar, and soils. 100
b Coal. 101
c Stone. 102
d Clays, sand, ochres, and kaolin. 104
e Tripoli. 106
f Peanuts. 605
g Wheat, rye, oats, barley, and corn. 620
h White beans and black-eyed peas. 621
i Millet. 624
j Cotton. 665
k Flax and hemp. 666
l Wool. 667
m Silk. 668
- 146 Cochran, John M., & Co., Bradford,** Pa.—Connellsville bituminous coal and coke. T 56. 101
- 147 Philadelphia and Reading Coal and** Iron Co., Philadelphia, Pa.—Anthracite coal. Y 56. 101
- 148 Kittaning Coal Co., Philadelphia,** Pa.—Section of coal-vein. Y 56. 101
- 149 Westmoreland Coal Co., Philadel-**phia, Pa.—Bituminous coal. Y 58. 101
- 150 Penn Gas Coal Co., Westmoreland** county, Pa.—Section of bituminous coal-vein. Y 56. 101
- 151 Van Wickle, Stout, & Co., New** York, N. Y.—Anthracite coal from Eber-
vale, Pa. W 53. 101
- 152 McClintock, I. R., Philadelphia,** Pa.—Products of asphaltum by the
McClintock process. T 56. 101
- 153 Linderman, G. B., Bethlehem, Pa.**—Anthracite coal. T 64. 101
- 154 Newton, Jotham, New York, N. Y.**—Composition fuel made of coal dust. T
57. 101
- 155 Rockhill Iron and Coal Co., Phila-**delphia, Pa.—Semi-anthracite coal; coke.
T 72. 101
- 156 Anthracite Fuel Co., Rondout, N.** Y.—Pressed coal from the culm of anthra-
cite. Y 54. 101
- 157 Hickory Coal Co., Pottsville, Pa.**—
Samples of coal. W 50. 101
- 158 Harleigh Coal Co., Philadelphia,** Pa.—Samples of coal. W 51. 101
- 159 Excelsior Coal Mining Co., Phila-**delphia, Pa.—Samples of coal. W 52. 101
- 160 Campbell, Tucker, & Co., Philadel-**phia, Pa.—Anthracite coal from the Wm.
Penn colliery. (Outside.) 101
- 161 Pardee, A., & Co., Hazelton, Pa.**—
Section of coal vein from lands of Lehigh
Valley Railroad Co., Hazelton, Pa. (Out-
side.) 101
- 162 Blauvelt, Jas. C., Marietta, Ohio.**—
Bituminous coal from Marietta Run,
Ohio. V 61 to 64. 101
- 163 Lexington and Carter county Min-**ing and Manufacturing Co., Lexington, Ky.
—Section of bituminous coal. T 68. 101

Minerals, Ores, Stone, Mining Products.

- 164 Keys, John, Brockwayville, Pa.—Lump of bituminous coal. Y 56. 101
- 165 Eastern Kentucky Railway, River-ton, Ky.—Sections of cannel and bitumi-nous coals. T 68. 101
- 166 Dysart & Co., Philadelphia, Pa.—Bituminous white ash coal from Cambria county, Pa. Y 57. 101
- 167 Kimes, J. B., & Co., Philadelphia, Pa.—Slate mantels, house decorations, building material. T 51. 102
- 168 Williams Marble and Slate Mantel Co., Philadelphia, Pa.—Marble and mar-bleized slate mantels, etc. T 48. 102
- 169 Wilson & Miller, Philadelphia, Pa.—Marbleized slate mantels, etc.; plain slate work. T 50. 102
- 170 Bye, E. Mortimer, Wilmington, Del.—Ornamental work made from Mary-land greenstone, etc. T 70. 102
- 171 Hayes, Coulter, & Co., Phila-delphia, Pa.—Slate mantels with grates. T 59. 102
- 172 Dougherty, E. D., Philadelphia, Pa.—Blocks of Dougherty marble of Ten-nessee, rough and polished; pedestals, slabs, etc. T 49. 102
- 173 Columbian Marble Co., Rutland, Vt.—Marble wainscoting, pedestal, tiling, etc. T 54. 102
- 174 Reitz & Bode, Portsmouth, Ohio.—Blue freestone and brownstone. T 53. 102
- 175 Wagner, John, Cleveland, Ohio.—Sawed Euclid bluestone, sandstone. T 51. 102
- 176 Gurney, H. D., St. Paul, Minn.—Minnesota granite—red, white, and blue. T 53. 102
- 177 Forest City Stone Co., Cleveland, Ohio.—Sawed stone flagging. T 54. 102
- 178 Mallory, Jas. E., New York, N. Y.—Marble from Snowflake marble quarry, Pleasantville, N. Y. (*Outside.*) 102
- 179 Martin, H. F., Allentown, Pa.—Slate mantels and blackboards, school slates, etc. T 50. 102
- 180 St. Cloud Granite Quarrying and Manufacturing Co., St. Paul, Minn.—Red and white granite. T 54. 102
- 181 Allen, James T., & Co., Philadel-phia, Pa.—Scagliola and Marezzo marble for interior decoration. T 54. 102
- 182 Fauchere, A. L., & Co.—New York, N. Y.—Marble mantels, etc. T 50. 102
- 183 Williams, Chas., St. Louis, Mo.—Tennessee, Italian, and Missouri marble work; jewel box. T 53. 102
- 184 Denton, Drake W., Philadelphia, Pa.—Excelsior slate roofing. T 56. 102
- 185 Tillson, Davis, Rockland, Maine.—Plain, polished, and ornamental granite work. T 51. 102
- 186 Maine Slate Co., Skowhegan, Maine.—Roofing slate. T 53. 102
- 187 Chapman Slate Co., Bethlehem, Pa.—Roofing slate, flagging, stairways, blackboards, posts, door and window sills, mantels. T 64. 102
- 188 Lehigh Slate Co., Slatington, Pa.—Roofing and school slate, mantels, black-boards, bath tubs; bureau, table, and washstand tops. T 64. 102
- 189 Allentown Slate Mantel Co., Allen-town, Pa.—Slate mantels. T 51. 102
- 190 Carpenter & Raymond, Cambridge City, Ind.—Monumental work. T 71. 102
- 191 McDonald, Alexander, Cambridge, Mass.—Rustic rockwork and cross. N 56. 102
- 192 Bodwell Granite Co., Rockland, Maine.—Granite samples. T 72. 102
- 193 Brinton, Joseph H., Thornbury P. O., Pa.—Serpentine stone from quarries in Chester county, Pa. T 55. 102
- 194 Scorgie, Wight, & Co., Cambridge, Mass.—Polished granite fountain. T 53. 102
- 195 Struthers, W., & Sons, Philadel-phia, Pa.—Mantels, font, and other marble work; sand-blast work. T 52. 102
- 196 Pennsylvania Marble Co., Phila-delphia, Pa.—Black marble mantel, book, and tiles. T 51. 102
- 197 Peach Bottom Slate Mining Co., Philadelpia, Pa.—Peach Bottom slate. T 50. 102
- 198 Rutland Marble Co., West Rut-land, Vt.—Wrought and unwrought mar-ble. T 59. 102
- 199 Maine Red Granite Co., Red Beach, Maine.—Red granite cube, columns, etc. T 55. 102
- 200 Columbia Slate Co., Slatington, Pa.—Manufactured Washington vein roofing slate. (*Outside.*) 102
- 201 Martin, F. O., St. George, Maine.—Block of dressed granite. T 64. 102
- 202 Wells, Chas. B., Marietta, Ohio.—Sandstone for building purposes. T 64. 102
- 203 St. Johnsbury Granite Co., St. Johnsbury, Vt.—Granite monument and tablet. (*Outside.*) 102
- 204 Merrille, Adams H., Williams-burgh, Maine.—Roofing slate. T 50. 102
- 205 Columbia Slate Co., Slatington, Pa.—Washington vein roofing slate. T 54. 102
- 206 Ohio Marble Co., Mineral Ridge, Ohio.—Crude and finished black marble. T 53. 102
- 207 Union Slate Company, Auburn, Maine.—Marbleized slate mantels, bracket shelves, and table tops. T 51. 102
- 208 Concord Granite Co., Quincy, Mass.—Granite pedestal. N 48. 102
- 209 Sheldons & Slason, West Rutland, Vt.—Pedestal of statuary and blue mottled marble. H 69. 102
- 210 Mitchell, William H., Quincy, Mass.—Pedestal of Quincy granite. N 58. 102
- 211 McNally, William G., Cleveland, Ohio.—Coat-of-arms of Ohio, carved from Berca stone. (*Ohio State Building.*) 102
- 212 Thompson, Wm. S., Springfield, Ohio. T 54. 102
a Stone. 102
b Lime. 103
- 213 Amherst Stone Co., Cleveland, Ohio. T 57. 102
a Blocks of sandstone. 102
b Grindstones. 106
- 214 Warthorst & Co., Massillon, Ohio. T 58. 102
a Blocks of sandstone. 102
b Grindstones. 106

Minerals, Ores, Stone, Mining Products.

- 215 Philadelphia and Reading Railroad Co., Philadelphia, Pa. T 72.
a Building stone. 102
b Limestone. 103
- 216 Worthington & Sons, North Amherst, Ohio. T 56.
a Amherst building stone. 102
b Grindstones, etc., from quarries at Amherst and Lake Huron, Mich. 106
- 217 Williams, R. L., Middle Granville, N. Y. T 51.
a Vermont and New York roofing slate. 102
b Car coupler. 576
- COLLECTIVE EXHIBIT OF BUILDING STONES USED IN THE OHIO STATE BUILDING.** 102
- 218 Hoffman, A. O., Thompson, Wm., and others, Springfield, Ohio.
- 219 Berea Stone Co., Berea, Ohio.
- 220 Hurst, I. K., Cleveland, Ohio.
- 221 Ford, O. D., Cleveland, Ohio.
- 222 Halderman, L., & Son, Cleveland, Ohio.
- 223 Wagner, John, Cleveland, Ohio.
- 224 Amherst Stone Co., Cleveland, Ohio.
- 225 Black River Stone Co., Cleveland, Ohio.
- 226 Paul, John, & Co., Massillon, Ohio.
- 227 Wilson & Hughes Stone Co., Cleveland, Ohio.
- 228 Clough Stone Co., Amherst, Ohio.
- 229 Worthington & Sons, Amherst, Ohio.
- 230 Ohio Stone Co., Cleveland, Ohio.
- 231 McDermott, J., & Co., Cleveland, Ohio.
- 232 Coshocton Stone Co., Coshocton, Ohio.
- 233 Stitt, Price, & Co., Columbus, Ohio.
- 234 Finnegan, M., Cincinnati, Ohio.
- 235 Finnegan, J. H., Cincinnati, Ohio.
- 236 Montgomery, R. M., Youngstown, Ohio.
- 237 Caldwell & Tod, Youngstown, Ohio.
- 238 Byers & McIlhainy, Youngstown, Ohio.
- 239 Mauser & Haid, Youngstown, Ohio.
- 240 Hamilton, Homer, Youngstown, Ohio.
- 241 Warthorst & Co., Massillon, Ohio.
- 242 Stocking, Z. S., Mansfield, Ohio.
- 243 Bosler, Marcus, Dayton, Ohio.
- 244 Huffman, William, Dayton, Ohio.
- 245 Tremain, Chas., Manlius, N. Y.—Cement and land plaster. T 57. 103
- 246 Quigg, J. Travis, Philadelphia, Pa.—Mantel-pieces, wainscoting, columns, pilasters, pedestals, table and bureau tops, etc. T 49. 103
- 247 Fireproof Building Co., New York, N. Y.—Teil concrete hollow blocks, hollow bricks, and beton blocks. T 55. 103
- 248 Mitchell, Wilson, Philadelphia, Pa.—Portsilica artificial stone building blocks, partitions, floors, colored paving tiles, etc. T 53. 103
- 249 Daniels, T. E., Detroit, Mich.—Artificial marble. T 56. 103
- 250 Wampum Cement and Lime Co., limited, New Castle, Pa.—Portland cement, and samples in artificial stone of various designs. T 57. 103
- 251 Coplay Cement Co., Allentown, Pa.—Cements, building blocks, pipe, ornaments, etc. T 56. 103
- 252 Allen Cement Co., Siegfried's Bridge, Pa.—Crude and manufactured cement. T 57. 103
- 253 Cedar Hollow Lime Co., Philadelphia, Pa.—Lime, lime rock, and model of furnace. T 58. 103
- 254 Lewis & Willett, Boston, Mass.—Highland artificial stone garden, vases and garden edging. T 54. 103
- 255 Abbott Pavement Co., Brooklyn, N. Y.—Pavement. T 70. 103
- 256 Union Stone Co., Boston, Mass. T 57.
a Articles in artificial stone, soapstone register borders, millstone cement, etc. 103
b Emery wheels. 106
- 257 Hampton, Cutter, & Sons, Woodbridge, N. J.—Clays, kaolin, sand. T 64. 104
- 258 Such, George, South Amboy, N. J.—Samples of clay. T 58. 104
- 259 Paul, John, & Co., Massillon, Ohio.—White sandstone and white rock sand for glass. T 51. 104
- 260 Walker, N. U., Wellsville, Ohio.—Fire clay. (*Outside.*) 104
- 261 Bradford, H., Philadelphia, Pa.—Maryland quartz. T 54. 104
- 262 Schreiber, W. A. H., Phoenixville, Pa.—Clay, kaolin, flint, spar, and sand; potters' and decorators' materials. T 69. 104
- 263 Toll, Charles, Monroe, Mich.—Washed and crude silex. V 67. 104
- 264 Gihlmann, Joseph, Bellaire, Ohio.—Wooden mold for shaping blown glass. T 64. 104
- 265 Dover Fire Brick Co., Canal Dover, Ohio.—Fire brick and fire clay. T 63. 104
- 266 Kreischer, B., & Son, Philadelphia, Pa.—Fire clay, etc. X 56. 104
- 267 American Kaolin Co., New Garden, Pa.—Kaolin, clays, and sand. X 58. 104
- 268 Dixon Crucible Co., Jersey City, N. J.—Crude and refined graphite. P 72. 105
- 269 Strow, Wile, & Co., Philadelphia, Pa.—Blacklead crucibles, retorts, covers, etc.; plumbago, crude and prepared; lumber pencils, stove polish. T 59. 105
- 270 Taylor, Robert, & Co., Philadelphia, Pa.—Blacklead crucibles. T 58. 105
- 271 Morse Bros., Canton, Mass.—Stove polish, lumber pencils, plumbago. T 56. 105
- 272 Agnew, D. F., & Co., Pittsburgh, Pa.—Plumbago crucibles, stove polish. T 58. 105
- 273 Jersey City Crucible Manufacturing Co., Jersey City, N. J.—Crucibles and stove polish. T 58. 105
- 274 Phoenix Manufacturing Co., Taunton, Mass.—Crucibles and stove polish. T 58. 105

Stone, Mining Products, Metallurgical Products.

- 275 Webb, Robert, Boston, Mass.—Stove polish, crude and prepared plumbago. T 60. 105
- 276 Taunton Crucible Co., Taunton, Mass.—Crucibles. T 60. 105
- 277 Hand, James C., & Co., Philadelphia, Pa.—Corundum manufactured by the Pennsylvania Corundum Co. T 57. 106
- 278 Washington Mills Emery Manufacturing Co., Ashland, Mass.—Emery. T 57. 106
- 279 Hyatt & Co., New York, N. Y.—Polishing powder. T 54. 106
- 280 Carey, Samuel, New York, N. Y.—Millstones. T 55. 106
- 281 Racine Hardware Manufacturing Co., Racine, Wis.—Jewelers' polishing lathe and head, turning lathe, power wheels, countershaft, and engraving stand. N 71. 106
- 282 Scardefiehl, G. W., Newark, N. J.—Burnishing stones and gilders' materials. T 57. 106
- 283 Detroit Polish Co., Detroit, Mich.—Diamond polish. T 57. 106
- 284 U. S. Soapstone Manufacturing Co., Cincinnati, Ohio.—Steatite. P 77. 106
- 285 Patten, F. H., Bath, Maine.—Feldspar and quartz, for potteries and sand paper factories. T 70. 106
- 286 Lehigh Whetstone Co., Allentown, Pa.—Whetstones from Lehigh mountain, near Allentown, Pa. T 57. 106
- 287 Russell, Jesse, Boston, Mass.—Emery and crocus cloth, emery wheels and sticks, ladies' scissors, and needle sharpeners. T 68. 106
- 288 Coffin, Redington, & Co., New York, N. Y.—Infusorial silica, from Nevada, and polishing powder. T 71. 106
- 289 Louis, Julius, & Bro., Jeffersonville, Ind.—Hot Springs, Arkansas, and other oilstones. N 68. 106
- 290 Sibley, Freeman K., Waltham, Mass.—Emery and crocus cloth. T 53. 106
- 291 Schultz, Carl H., New York, N. Y.—Carbonic acid and mineral spring waters, siphons, glass fountains, etc. T 58. 107
- 292 Knight & Widden, Portland Plaster Mills, Portland, Maine.—Calcined and ground land plaster. T 59. 107
- 293 Champion Spouting Spring, Saratoga Springs, N. Y.—Saratoga water. T 58. 107
- 294 Godfrey, Bro., & White, Grand Rapids, Mich.—Raw, manufactured, and natural crystalized gypsum. T 59. 107
- 295 Gettysburg Katalysine Co., Gettysburg, Pa.—Katalysine spring water. T 57. 107
- 296 Navassa Phosphate Co., Baltimore, Md.—Crude and ground phosphates, from Navassa Island, West Indies, and other fertilizing materials. T 57. 107
- 297 Charleston, S. C., Mining Co., Philadelphia, Pa.—Goodrich phosphatic nodules, mined from Agassiz's Ashley fish basin, Lamb's landing, S. C. T 58. 107
- 298 Bolen & Byrne, New York, N. Y.—Artificial mineral waters, granular effervescing salts, siphons, etc. T 60. 107

- 299 Lippincott, Chas., & Co., Philadelphia, Pa.—Apparatus for dispensing aerated waters. B 38. 107
- 300 Lawrence, A. R., & Co., Saratoga Springs, N. Y.—Saratoga waters, and apparatus for drawing them. T 68. 107

Metallurgical Products.

- 301 Hastings & Co., Philadelphia, Pa.—Gold leaf, foil, and bronze; silver leaf, bronze powder, etc. P 47. 110
- 302 Auer, Henry, Philadelphia, Pa.—Silver leaf, in all its stages of manufacture. P 43. 110
- 303 Cambria Iron and Steel Co., Johnstown, Pa.—Iron—pig, bloom, and muck bar, rail piles and rails; steel—Bessemer pig, and spiegeleisen, ingots, blooms, and rails. T 65. 111
- 304 Wood, W. D., & Co., McKeesport Iron Works, Pittsburgh, Pa.—Patent planished sheet iron. T 61. 111
- 305 Park Bros. & Co., Black Diamond Steel Works, Pittsburgh, Pa.—Cast steel; samples of homogeneous crucible cast steel boiler plate and flangings. T 62. 111
- 306 Rowland, James, & Co., Kensington Iron and Steel Works, Philadelphia, Pa.—Anvil brand, refined bar, band, skelp, hoop, and nut iron; plow, cultivator, and shovel steel. T 63. 111
- 307 Wood, Alan, & Co., Philadelphia, Pa.—Planished, galvanized, and common, and charcoal bloom, sheet, and plate iron. T 61. 111
- 308 Straus, J. E., & Co., Philadelphia, Pa.—Hoop iron. P 71. 111
- 309 Miller, Metcalf, & Parkins, Crescent Steel Works, Pittsburgh, Pa.—Crucible steel and articles manufactured therefrom. T 60. 111
- 310 Hussey, Wells, & Co., Pittsburgh, Pa.—Crucible cast steel bars, sheets, homogeneous boiler plates, railway axles, forgings, edge tools, rake teeth. T 68. 111
- 311 Phillips, Nimick, & Co., Sligo Iron and Steel Works, Pittsburgh, Pa.—Iron and steel. T 63. 111
- 312 Union Iron Co. of Buffalo, Buffalo, N. Y.—Solid wrought iron rolled beams. U 57 to 60. 111
- 313 Otis Iron and Steel Co., Cleveland, Ohio.—Ingots, bars, plates, and forgings of Siemen's Martin steel. T 65. 111
- 314 Cleveland Rolling Mill Co., Cleveland, Ohio.—Pig metals, rails, bars, etc., of iron and Bessemer or Siemen's Martin steel. T 60. 111
- 315 Akron Iron Co., Akron, Ohio.—Best common and refined iron; iron for agricultural implements. T 62. 111
- 316 State of New Jersey (by Geo. H. Cook, State Geologist, New Brunswick, N. J.). T 70. 111
a Iron, steel, spiegeleisen. 111
b Spelter, sheet zinc, zinc white. 113
- 317 Penn Steel and Iron Co., Clintonville, N. Y.—Loops, blooms, billets, bars, and steel. T 63. 111
- 318 Washburn & Moen Manufacturing Co., Worcester, Mass.—Iron wire rods; iron and steel wire. T 63. 111

Metallurgical Products.

- 319 American Sheet and Boiler-plate Co., Cleveland, Ohio.**—Plate, sheet, corrugated, galvanized, metallic tile, universal plate and agricultural iron, Bessemer or Siemen's Martin steel. T 59. III
- 320 Cooper, Hewitt, & Co., New York, N. Y.**—Iron fluxes, blooms, pigs, rods, bars, rails, beams; chain, wire, horseshoe, and Martin steel. T 66. III
- 321 Hanging Rock Iron Region Furnaces, Chas. Campbell, Commissioner, Ironton, Ohio.**—Pig iron, with articles manufactured therefrom. T 69. III
- 322 Beale, Horace A., Parkesburg, Pa.**—Rolled iron for boiler tubes and plates, hollow bottom plates for puddling furnaces. T 66. III
- 323 Clark, Wm., & Co., Pittsburgh, Pa.**—Hoop, band, and scroll iron. T 66. III
- 324 Reese, Graff, & Woods, Pittsburgh, Pa.**—Wrought iron, cast and special steel, horse and mule shoes, steel yoe calks. T 66. III
- 325 Pittsburgh Steel Casting Co., Pittsburgh, Pa.**—Cast steel castings. T 66. III
- 326 McCullough Iron Co., Philadelphia, Pa.**—Bloom and refined cleaned sheet iron; charcoal blooms. P 70. III
- 327 Moorehead & Co., Soho Iron Mills, Pittsburgh, Pa.**—Galvanized and block sheet iron; roofing and ceiling irons. T 66. III
- 328 Henderson, James, Hamburg, Pa.**—Wrought iron made by the Henderson process. T 59. III
- 329 Brown & Co., Wayne Iron and Steel Works, Pittsburgh, Pa.**—Cold-blast charcoal metal, blooms, boiler plate, bars; agricultural irons. T 62. III
- 330 Guille Anti-friction Metal Co., New York, N. Y.**—Anti-friction metal for solid bearings of machinery and railroads. T 63. III
- 331 Edgar Thomson Steel Co. (limited), Pittsburgh, Pa.**—Bessemer steel rails, billets, blooms, and ingots. T 66. III
- 332 Edgar Thomson Steel Co. (limited), Pittsburgh, Pa.**—Steel rails. (*Outside.*) III
- 333 Lucy Furnace Co., Pittsburgh, Pa.**—Pig metal, etc. T 66. III
- 334 Carnegie Bros. & Co., Pittsburgh, Pa.**—Wrought iron beams, channels, bridge iron, etc. T 66. III
- 335 Wilson, Walker, & Co., Pittsburgh, Pa.**—Railroad car forgings. T 66. III
- 336 Keystone Bridge Co., Pittsburgh, Pa.**—Baritan Bay pivot bridge, weldless chord bars, wrought iron tubular sectional columns. T 66. III
- 337 United States Corrugated Elbow Co., Cincinnati, Ohio.**—Stovepipe elbow machine; stovepipe elbows T 61. III
- 338 Gregory & Co., Jersey City, N. J.**—American cast steel. T 59. III
- 339 Duncan, John W., Philadelphia, Pa.**—Pig metal. T 72. III
- 340 Tuscarawas Coal and Iron Co., Cleveland, Ohio.**—Pig iron. T 71. III
- 341 Rhodes & Co., Cleveland, Ohio.**—Bessemer car-wheel and malleable charcoal irons. T 71. III
- 342 Woodstock Iron Co., Anniston, Ala.**—Hot-blast, cold-blast, and spiegel-eisen iron, charcoal. T 63. III
- 343 Brady, Edward, Philadelphia, Pa.**—Button fastenings, collars, skates, steel, armor plates, and bolts. T 63. III
- 344 Crane Iron Co., Catasauqua, Pa.**—Foundry and forge pig iron; cinder. T 64. III
- 345 Alexander, John S., Philadelphia, Pa.**—Bayonet spade. T 70. III
- 346 Singer, Nimick, & Co., Pittsburgh, Pa.**—Saw, tool, plow, machinery, safe, and boiler steel; steel railway axles and springs. T 69. III
- 347 Magnetic Iron Co., Philadelphia, Pa.**—Bessemer ore products. T 69. III
- 348 Crab Orchard Iron Co., Phila., Pa.**—Samples of iron and steel. T 69. III
- 349 Danville Iron Co., Danville, Pa.**—Railroad iron. T 66. III
- 350 Winch, Corydon, Philadelphia, Pa.**—Wrought iron spikes. T 66. III
- 351 Philadelphia Iron and Steel Co., Philadelphia, Pa.**—Special shapes and manufactures of iron. T 66. III
- 352 Cumberland Nail and Iron Co., Bridgeton, N. J.**—Wrought iron pipe. T 66. III
- 353 Davis, O. W., jr., Bangor, Me.**—Charcoal pig iron, fluxes, cinders; articles made in part from Katahdin iron. T 69. III
- 354 Durham Iron Co., Riegelsville, Pa.**—Flux, pig iron, and cinders. T 64. III
- 355 Glendon Iron Co., Easton, Pa.**—Flux, slag, and pig iron. T 64. III
- 356 Uhler, Peter, Easton, Pa.**—Flux, slag, pig iron. T 64. III
- 357 Keystone Iron Co., Easton, Pa.**—Flux, slag, and pig iron. T 64. III
- 358 Carter, W. T., & Co., Redington, Pa.**—Pig iron, slag. T 64. III
- 359 Northampton Furnace, worked by the Bethlehem Iron Co., Bethlehem, Pa.**—Pig iron, flux, slags. T 64. III
- 360 Lehigh Iron Co., Allentown, Pa.**—Flux, slag, and pig iron. T 64. III
- 361 Bethlehem Iron Co., Bethlehem, Pa.**—Charges and products of iron, Bessemer, and spiegeleisen furnaces; products from Bessemer steel mill. T 64. III
- 362 Emaus Iron Co., Allentown, Pa.**—Flux, slag, and iron. T 64. III
- 363 Millerstown Iron Co., Allentown, Pa.**—Flux and pig iron. T 64. III
- 364 Thomas Iron Co., Hokendauqua, Pa.**—Iron and flux. T 64. III
- 365 Allentown Rolling Mill Co., Allentown, Pa.**—Flux, iron, and slag, fist-plate bolts, nuts, spikes, rivets, etc. T 64. III
- 366 Allentown Iron Co., Allentown, Pa.**—Pig iron. T 64. III
- 367 Lehigh Valley Iron Co., Copley, Pa.**—Pig iron, cinders. T 64. III
- 368 Carbon Iron Co., Parryville, Pa.**—Flux, slag, and pig iron. T 64. III
- 369 Sancon Iron Co., Hellertown, Pa.**—Pig iron. T 64. III
- 370 Catasauqua Iron Co., Catasauqua, Pa.**—Rolled iron and steel, iron and steel bars bent hot and cold and fractured. T 64. III
- 371 Lehigh Zinc Co., Bethlehem, Pa.**—Metallic and sheet zinc, zinc oxide. T 64. III

Founded July 4th, 1808.



PHILADELPHIA SHOT TOWER

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FACTORY, 125 to 131 CARPENTER STREET,

PHILADELPHIA.

CIRCULAR

Showing the average weight and diameter of Shot manufactured by THOMAS W. SPARKS.

MOULD SHOT.

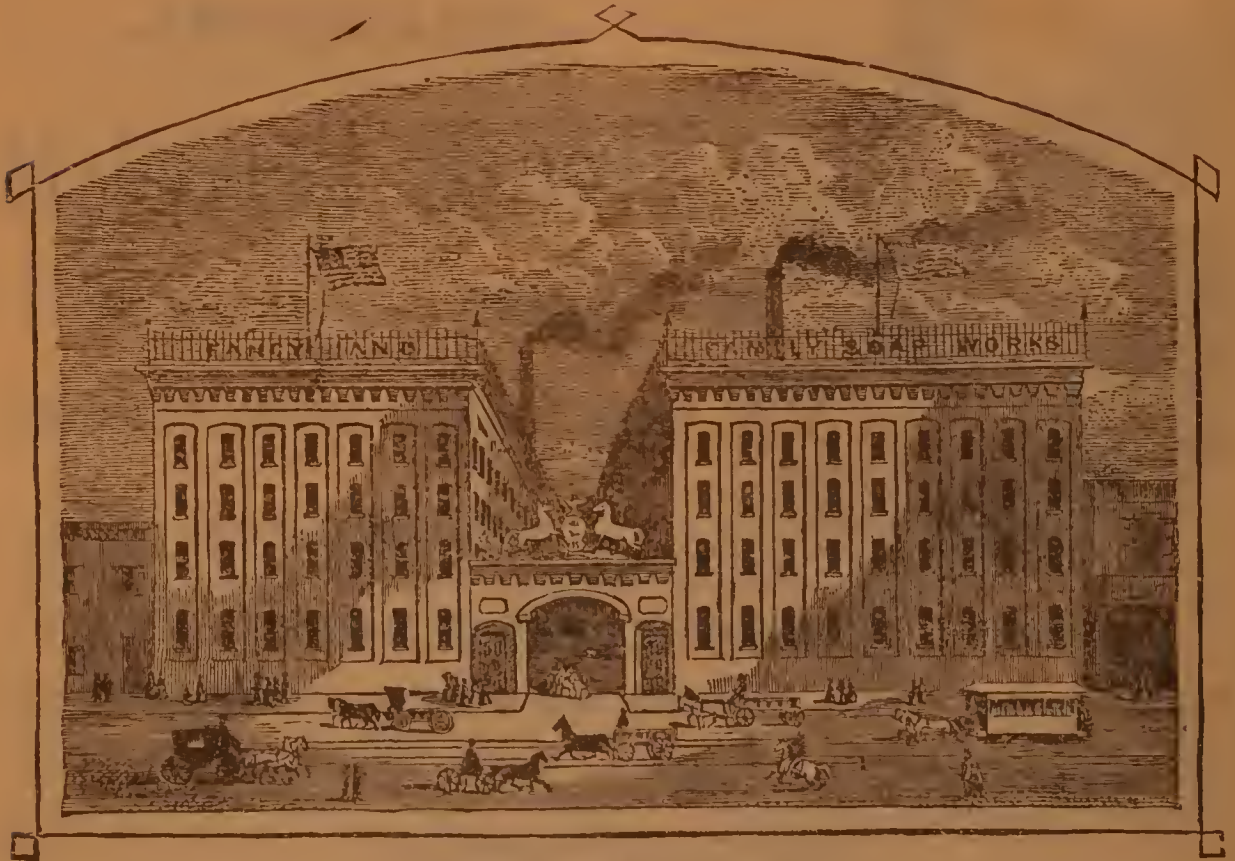
CALIBRE OR AVERAGE DIAM.	NUMBER.	NUMBER TO LB.	NUMBER OF PELLETS TO AN OUNCE, AVOIRDUPOIS.	
			As Found.	Without Fractions.
0.3329 inch.	L. Buck	128	8.00	
0.3256 "	C P	136	8.51	
0.3186 "	O	144	9.01	
0.3105 "	Buck	165	9.61	
0.2801 "	G	212	13.15	
0.2495 "	S G	320	18.62	

DROP SHOT.

0.1927 inch.	T	40.53	41
0.1768 "	B B B	50.49	50
0.1704 "	B B	58.80	59
0.1623 "	B	69.64	70
0.1512 "	1	84.76	85
0.1420 "	2	102.24	102
0.1358 "	3	117.57	118
0.1281 "	4	143.45	143
0.1151 "	5	187.49	187
0.1024 "	6	266.53	267
0.0968 "	7	317.04	317
0.0838 "	8	515.23	515
0.0733 "	9	714.69	715
0.0644 "	10	1097.92	1098
0.0538 "	11	1825.87	1826
0.0490 "	12	2918.38	2918

ALL SIZES OF CONICAL AND RIFLE BALLS CONSTANTLY ON HAND.

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FINEST TOILET SOAPS.

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PARISIAN BOUQUET, TURKISH BATH, OATMEAL, .
GLYCERINE, TURTLE OIL, HONEY,
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MADE FROM PURE OLIVE OIL.

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Saxon Fig.

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Bradford Scouring.

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Metallurgical Products.

- 372 Stewart & Co., South Easton, Pa.—Round, square, and triangular iron wire. T 64. III
- 373 Gough, Edward, Allentown, Pa.—Turned rolls. T 65. III
- 374 Bay State Iron Co., Boston, Mass.—Homogeneous iron boiler plates and iron. T 64. III
- 375 Co-operative Iron and Steel Works, Danville, Pa.—T and street passenger railroad iron. T 63. III
- 376 Shalter, R. M., Carrick Furnace, Franklin county, Pa.—Cold-blast pig iron. T 63. III
- 377 Philadelphia and Reading Railroad Co., Philadelphia, Pa.—Rails. T 72. III
- 378 Nes, Charles M., and Mintzer, S. J., Philadelphia, Pa.—Steel and steel-capped rails. T 63. III
- 379 Shelley Iron Co., Shelley Iron Works, Ala.—Charcoal pig iron, chilled castings, wire rods, cotton ties. T 71. III
- 380 Chrome Steel Co., Brooklyn, N. Y.—Chrome steel, with samples showing torsional, tensile, and compressive strength; welded chrome steel and iron, ingredients of manufacture. T 64. III
- 381 Cartwright, McCurdy, & Co., Youngstown, Ohio.—Hoop iron. T 64. III
- 382 Jones, Ingold, & Co., Pittsburgh, Pa.—Tool and die cast steel, material of manufacture, fluxes, crucibles. T 67. III
- 383 Rockhill Iron and Coal Co., Philadelphia, Pa.—Pig iron. T 72. III
- 384 Tecumseh Iron Co., Tecumseh, Ala.—Charcoal pig iron, limestone, charcoal. T 70. III
- 385 Albany and Rensselaer Iron and Steel Co., Troy, N. Y.—Bessemer steel and iron rails, plates, merchant bars, axles, horseshoes, etc. T 68. III
- 386 Atha, Benj., & Co., Newark, N. J.—Round rolled cast steel. T 71. III
- 387 Morse & Bennett, New York, N. Y.—Steel railroad axle, tubing and spinning rings. T 68. III
- 388 Grand Tower Mining, Manufacturing, and Transportation Co., Grand Tower, Ill.—Iron ore products, cokes. T 68. III
- 389 Globe Rolling Mill Co., Cincinnati, Ohio.—Iron. T 63. III
- 390 Lackawanna Iron and Coal Co., Scranton, Pa.—Steel and iron railroad bars. U 52. III
- 391 Passaic Rolling Mill Co., Paterson, N. J.—Rolled iron, rivets, nuts. T 64. III
- 392 Cox, Justice, jr., & Co., Philadelphia, Pa.—Pig, bar, sheet, tank, pipe, and angle iron; spikes, railway car axles. T 70. III
- 393 Riverside Iron Works, Wheeling, W. Va.—Nails, spikes; bar and pig iron. T 64. III
- 394 I. & I. Rogers Iron Co., Ausable Forks, N. Y.—Round and square iron and charcoal billets for steel, from Palmer ore. T 62. III
- 395 Vesuvius Furnace, Etna Iron Works, Ironton, Ohio.—Pig iron, cold blast charcoal car-wheel iron. T 68. III
- 396 Etna Furnace, Etna Iron Co., Hanging Rock, Ohio.—Pig iron, cold-blast charcoal car-wheel iron. T 68. III
- 397 Alice Furnace, Etna Iron Works, Hanging Rock, Ohio.—Pig iron, "Whitwell ovens" and Ferry process. T 68. III
- 398 Blanche Furnace, Etna Iron Works, Ironton, Ohio.—Pig irons, Whitwell hot-blast and Ferry process. T 68. III
- 399 Hecla Iron and Mining Co., Ironton, Ohio.—Pig iron, cold-blast charcoal car-wheel irons. T 68. III
- 400 Monitor Furnace Co., Ironton, Ohio.—Pig iron, cold-blast charcoal car-wheel iron. T 68. III
- 401 Mount Vernon Furnace, Hiram Campbell & Sons, Ironton, Ohio.—Pig iron, hot-blast charcoal foundry iron. T 68. III
- 402 Grant Furnace, W. D. Kelly & Sons, Ironton, Ohio.—Pig iron, hot-blast charcoal irons. T 68. III
- 403 Center Furnace, W. D. Kelly & Sons, Ironton, Ohio.—Pig iron, hot-blast charcoal irons. T 68. III
- 404 Howard Furnace Charcoal Iron Co., Ironton, Ohio.—Pig iron, hot-blast charcoal irons. T 68. III
- 405 Buckhora Furnace, Charcoal Iron Co., Ironton, Ohio.—Pig iron, hot-blast charcoal irons. T 68. III
- 406 Olive Furnace, Campbell, McGugin, & Co., Ironton, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 407 Lawrence Furnace Co., Ironton, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 408 Pine Grove Furnace, Means, Kyle, & Co., Hanging Rock, Ohio.—Pig iron, hot-blast charcoal irons. T 68. III
- 409 Ohio Furnace, Means, Kyle, & Co., Hanging Rock, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 410 Ironton Furnace Iron and Steel Co., Ironton, Ohio.—Pig iron, Player hot-blast. T 68. III
- 411 Belfont Iron Works, Ironton, Ohio.—Pig iron, Player hot-blast. T 68. III
- 412 Washington Furnace, Union Iron Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 413 Scioto Furnace, L. C. Robinson & Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 414 Bloom Furnace, John Paul & Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal irons. T 68. III
- 415 Clinton Furnace, W. I. Bell, Wheelersburg, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 416 Buckeye Furnace Co., Jackson, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 417 Cambria Furnace, D. Lewis & Co., Samsonville, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 418 Jackson Furnace, L. P. N. Smith's heirs, Sciotoville, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 419 Jefferson Furnace Co., Oak Hill, Ohio.—Pig iron; cold-blast charcoal car-wheel and machinery iron. T 68. III

Metallurgical Products.

- 420 Orange Iron Co., Jackson, Ohio.—Pig iron, hot-blast Jackson county stone coal iron. T 68. III
- 421 Star Furnace Co., Jackson, Ohio.—Pig iron, hot-blast Jackson county stone coal iron. T 68. III
- 422 Huron Iron Co., Jackson, Ohio.—Pig iron, hot-blast Jackson county stone coal iron. T 68. III
- 423 Tropic Furnace Co., Jackson, Ohio.—Pig iron, hot-blast Jackson county stone coal iron. T 68. III
- 424 Globe Iron Co., Jackson, Ohio.—Pig iron, hot-blast Jackson county stone coal iron. T 68. III
- 425 Fulton Furnace, Globe Iron Co., Jackson, Ohio.—Pig iron, hot-blast Jackson county stone coal iron. T 68. III
- 426 Ophir Furnace Co., Jackson, Ohio.—Hot-blast pig iron. T 68. III
- 427 Milton Furnace and Coal Co., Wellston, Ohio.—Pig iron, Jackson county softener iron. T 68. III
- 428 Wellston Coal and Iron Co., Wellston Ohio.—Pig iron, Jackson county stone coal iron. T 68. III
- 429 Lincoln Furnace, I. M. McGhee's estate, Rud's Mills, Ohio.—Pig iron, cold-blast charcoal iron. T 68. III
- 430 Eagle Furnace, L. C. Damarin & Co., Rud's Mills, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 431 Richland Furnace Co., Richland P. O., Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 432 Hope Furnace, L. C. Damarin & Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 433 Hamden Furnace, L. C. Damarin & Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 434 Vinton Furnace, Bancroft, Rader, & Co., Vinton Station, Ohio.—Pig iron, hot-blast bituminous coal and coke irons. T 68. III
- 435 Keystone Furnace Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 436 Monroe Furnace, Union Iron Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 437 Latrobe Furnace, Bundy & Cobb, Berlin Cross-roads, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 438 Logan Furnace Co., Logan county, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 439 Union Furnace, Brooks & Hueston, Haydensville, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 440 Pascal Iron Works, Philadelphia, Pa.—Cast iron work for Main Exhibition building. III
- 441 Lewis, Oliver, & Phillips, Pittsburgh, Pa.—Iron in merchant bars and odd shapes. T 64. III
- 442 Roberts, Henry, Newark, N. J.—Iron, Bessemer steel, and cast steel wire. N 69. III
- 443 Andrews, Hitchcock, & Co., Cleveland, Ohio.—Merchant bar and sheet iron. V 61 to 64. III
- 444 Mount Savage Furnace, Lexington and Carter county Mining and Manufacturing Co., Lexington, Ky.—Pig iron, hot-blast charcoal iron. T 68. III
- 445 Buffalo Furnace, Culbertson, Earhart, & Co., Greensburg, Ky.—Pig iron, hot and cold-blast charcoal iron. T 68. III
- 446 Hunnewell Furnace, Eastern Kentucky Railway Co., Riverton, Ky.—Pig iron, hot-blast charcoal foundry iron. T 68. III
- 447 Pennsylvania Furnace, Eastern Kentucky Railway Co., Riverton, Ky.—Pig iron, hot-blast charcoal foundry iron. T 68. III
- 448 Charlotte Furnace Co., Riverton, Ky.—Pig iron, hot-blast charcoal foundry iron. T 68. III
- 449 Laurel Furnace, Robert Scott & Co., Riverton, Ky.—Pig iron, cold-blast charcoal car-wheel iron. T 68. III
- 450 Gallia Furnace, Norton, Campbell, & Co., Portsmouth, Ohio.—Pig iron, hot-blast charcoal iron. T 68. III
- 451 Raccoon Mining and Manufacturing Co., Riverton, Ky.—Pig iron, hot and cold-blast charcoal iron. T 68. III
- 452 Ashland Furnace, Lexington and Big Sandy Railroad Co., Ashland, Ky.—Pig iron, bituminous coal, and Player hot-blast. T 68. III
- 453 Bellefonte Furnace, Means, Russell, & Means, Ashland, Ky.—Pig iron, hot-blast charcoal foundry iron. T 68. III
- 454 Norton Iron Works, Ashland, Ky.—Pig iron, nail plate, nails. T 68. III
- 455 Buenavista Furnace, Means & Co., Ashland, Ky.—Pig iron, hot-blast charcoal iron. T 68. III
- 456 Trigg Furnace, D. Hillman & Sons, Empire Iron Works, Ky.—Pig iron, cinders, etc.; hot-blast charcoal iron. T 68. III
- 457 Center Furnace, D. Hillman & Sons, Empire Iron Works, Ky.—Pig iron, hot-blast charcoal iron. T 68. III
- 458 Empire Iron Works, Trigg county, Ky.—Samples of boiler plate and refined charcoal iron. T 68. III
- 459 Cleveland Malleable Iron Co., Cleveland, Ohio.—Malleable iron castings and tackle blocks; fifth wheels. T 68. III
- 460 Traber & Aubery, Cincinnati, Ohio.—Broken car-wheels, chill tests, and castings from Hanging Rock pig iron; pig iron. T 68. III
- 461 Hanging Rock Iron Region, Ironton, Ohio.—Pig iron. T 68. III
- 462 Sellers, William, & Co., Edgemoor Iron Co., Wilmington, Del.—Wrought and cast iron work for Main Exhibition Building. III
- 463 Roberts, A. & P., Pencoyd Rolling Mills, Philadelphia, Pa.—Wrought iron work for Main Exhibition Building. III
- 464 Morris, Tasker, & Co., Philadelphia, Pa.—Cast iron work for Main Exhibition Building. III
- 465 Watson Manufacturing Co., Paterson, N. J.—Iron framework of the Main Exhibition Building. III

Metallurgical Products, Mining Engineering.

- 466 Pusey, Jones, & Co., Wilmington, Del.—Iron work for Machinery Hall. 111
- 467 State of Michigan (Jay A. Hubbell, Houghton, Mich., Superintendent of Mineral Department). V 67.
- a Pig, ingot, and manufactured iron and steel. 111
- b Ingot, bar, and rolled copper in its various stages. 112
- c Maps, models, stamp-mill model, etc. 120
- 468 Manhattan Brass Co., New York, N. Y.—Sheet brass; brass, copper, and zinc tubing; brass goods, nickel-plated oilers, etc. T 65. 112
- 469 Pope, Cole, & Co., Baltimore Copper Co., Baltimore, Md.—Specimens of copper mattes and slags, and refined copper; metallurgical products. T 64. 112
- 470 Revere Copper Co., Boston, Mass.—American copper; yellow metal and bronze cannon. T 64. 112
- 471 Pennsylvania Lead Co., Pittsburgh, Pa.—Refined pig lead from ores of Colorado and Utah. T 40. 113
- 472 Benedict & Burnham Manufacturing Co., Waterbury, Conn.—Sheet brass, German silver, brass tubing, rods, and wire, lamp burners, etc. T 61. 113
- 473 Passaic Zinc Co., Passaic, N. J.—Zinc ingots, foil, castings, and oxide; sheet zinc. T 63. 113
- 474 Holmes, Booth, & Haydens, Waterbury, Conn.—Brass and German silver wire, tubing, rivets, lamp trimmings, burners. T 61. 113
- 475 Brown & Brothers, Waterbury, Conn.—Sheet copper and brass; brass kettles, tubing, wire, rivets. N 71. 113
- 476 Matthiessen & Hegeler Zinc Co., La Salle, Ill.—Zinc plates and sheets for galvanic batteries and signs. T 70. 113
- 477 Wharton, Joseph, Camden, N. J.—Nickel goods. T 63. 114
- 478 Taylor, N. & G., Co., Philadelphia, Pa.—Tin plate patterns. T 62. 114
- 479 Baker, Joseph W., Philadelphia, Pa.—Anti-friction metals; tinmen's and spelter solder; sounding leads. T 67. 114
- 480 Scovill Manufacturing Co., Waterbury, Conn.—Sheet brass; German silver, gold and silver plated metal; lamps and trimmings; hinges, buttons, thimbles, castors, metal tubes, etc. P 67. 114
- 481 Ansonia Brass and Copper Co., Ansonia, Conn.—Brass and copper goods, sheet metal and wire, planished brass and copper. N 57. 114
- 482 Waterbury Brass Co., Waterbury, Conn.—Brass, German silver; brass wire and kettles; copper rivets, percussion caps, powder flasks, etc. T 62. 114
- 483 Lancroft, C. E. & H. B., Fair Haven, Conn.—Sulphates of nickel, ammonia, cobalt, and aluminum. P 68. 114

Mining Engineering.

- 484 Holley, Alexander L., New York, N. Y.—Exhibit relating to metallurgical engineering. (*West gallery*.) 120
- 485 State of New Jersey (by Geo. H. Cook, State Geologist, New Brunswick, N. J.),—Geological maps, mine maps, mine and vein models. T 70. 121
- 486 Prince, Franklin, & Buñock, E. L., Audenried, Pa.—Model of the Wharton anthracite coal-vein at Beaver Brook collieries, Audenried, Pa. T 60. 121
- 487 Hanford, Theodore, Jersey City, N. J.—Specimen of the strata of the Gravel-pit Gold Mines of Ballarat, Victoria, Australia. T 64. 121

GREAT BRITAIN.—STATISTICAL PREFACE.

THE following brief table is given (approximately) of the area, population, revenue, and commerce of the British Empire. It is not possible to give the exact figures, but for all practical purposes those now given will be sufficient. The colonies which exhibit are treated under their proper names.

NAME OF COUNTRY.	AREA IN SQUARE MILES.	POPULATION.	REVENUE.	PUBLIC DEBT.	IMPORTS AND EXPORTS.
Great Britain and Ireland,	122,518	31,857,338	\$389,600,000	\$3,555,100,000	\$3,262,900,000
Indian Possessions, etc., .	1,558,254	240,000,000	243,500,000	550,310,000	472,390,000
Other Eastern Possessions,	25,264	3,150,000	10,714,000	8,766,000	160,710,000
Australasia,	3,087,000	2,105,000	53,570,000	219,150,000	365,250,000
North America,	3,620,500	4,000,000	21,915,000	107,140,000	209,410,000
Africa,	250,000	1,400,000	4,870,000	7,792,000	43,830,000
West Indies,	12,707	1,075,000	535,700	4,870,000	48,700,000
European Possessions, .	120	160,000	1,022,700	1,217,500	73,050,000
Various settlements, . .	96,171	200,000	2,678,500	3,165,500	24,350,000
Totals,	8,772,534	283,947,338	\$728,405,900	\$4,457,511,000	\$4,660,590,000

The *United Kingdom of Great Britain and Ireland* is the full designation of the country more generally known as Great Britain or the United Kingdom. It includes the two large islands of Great Britain and Ireland, and the adjacent smaller islands, together with the Channel Islands and the Isle of Man.

The following table exhibits the area, in English square miles, and population, according to the last census of the several constituent parts:

	AREA.	POPULATION.
England,	50,922	21,495,131
Wales,	7,397	1,217,135
Scotland,	31,324	3,360,018
Great Britain,	89,648	26,072,284
Ireland,	32,481	5,411,416
Isle of Man, and Channel Islands,	394	144,638
Army and Navy, and Merchant Seamen,	122,518	229,000
		31,857,338

The island of Great Britain lies between latitude 49° 57' 30" and 58° 40' 24" north, and between longitude 1° 46' east, and 6° 13' west, and is the largest island in Europe. It is bounded on the north by the Atlantic, on the east by the North Sea, and on the south by the English Channel, and on the west by the Atlantic, the Irish Sea, and St. George's Channel. Its greatest length is about 608 miles, and its greatest breadth (from Land's End to the east coast of Kent), about 300 miles.

England, which may be roughly said to be divided from Scotland on the north by the Cheviot Hills and the Rivers Tyne and Solway, and from Wales by the Severn

and Dee, is, except on the west and north, for the most part a level country, so cultivated as to be highly productive. The other districts have mineral riches, as iron, tin, lead, copper, and coal, which make abundant amends for the poverty of their surface. Wales is generally mountainous, and also has great mineral wealth.

The greater part of the surface of Scotland is irregularly distributed into mountains and valleys, a very small proportion spreading into level plains. The eastern coast forms a waving, continuous, and rarely broken line; the western is extremely irregular, being deeply indented with bays and arms of the sea, and exhibiting steep promontories and mountainous islands. The whole country is physically divided into *Highlands* and *Lowlands*—the former comprehending the northwest, west, and central portions; the latter, generally speaking, the east coast and the country south of the Forth and Clyde.

Ireland is an island lying between $51^{\circ} 26'$ and $55^{\circ} 23'$ north latitude, and $5^{\circ} 20'$ and $10^{\circ} 26'$ west longitude. It is about 60 miles to the west of England. On three sides it is washed by the Atlantic Ocean, and on the east by the Irish Sea and St. George's Channel. Its greatest length is, from north to south, 306 miles, and from east to west 120 to 180 miles. Ireland is divided into the four provinces of Ulster, Leinster, Munster, and Connaught, which are again subdivided into 32 counties.

The geology of Great Britain is of peculiar importance. British geologists have given to the world the names whereby the various strata are known, and British rocks form the typical series of the earth's strata. The whole recognized series of stratified deposits occur in Britain, one or two only being more fully developed elsewhere; and it is only in these singular cases that the foreign equivalents are taken as the types. British geology is no less important from the influence it has had in the development of the country, its mineral wealth, especially the coal and iron, being the real sinew of Britain's wealth and power.

In the year 1874, there was produced from the ore nearly 6,000,000 tons of pig iron, value £16,476,372; and 385 ounces of gold were raised, value £1540. Copper, tin, lead, zinc, silver, and other metals brought the total value of metals produced up to £19,539,070. The aggregate value of all the minerals, metals, coal, etc., obtained in the United Kingdom in 1874, was £67,834,313. Included in this were 125,043,257 tons of coal, value £46,849,194.

The climate of Great Britain is mild and equable in a remarkable degree, the winters being considerably warmer and the summers colder than at places within the same parallels of latitude. The mean temperature of England is 49.5° , and of Scotland 47.5° .

Very few species of plants or animals are peculiar to Great Britain. The flora, for the greater part, resembles that of Germany; but in the south of England there is, as might be expected, a closer correspondence with that of the northwest of France; and some plants found in the Channel Islands and on the French coast appear nowhere in Britain but on the southwest coast of England. The mountains of Wales, Cumberland, and Scotland have a vegetation resembling that of Scandinavia more than that of the mountains of central or southern Europe. The state of the case is much the same as to the fauna. There are, however, many remarkable instances both of plants and animals, which, from these apparent relations to continental Europe, might be expected in Great Britain, and which are not indigenous to it; as, for instance, among plants, the Norway spruce, and among animals, the lemming, both common in Scandinavia. The progress of civilization and of cultivation has completely banished from Great Britain many of the animals which were once numerous, as bears, wolves, etc. On the other hand, many plants which were unquestionably introduced by man, have become thoroughly naturalized.

For administrative purposes, Great Britain with its surrounding islands (excepting the Channel Islands and the Isle of Man, which are under peculiar jurisdiction) is divided into 84 counties or shires.

The soil of Great Britain is almost exclusively devoted to the production of the two primary necessities of society,—breadstuffs (chiefly wheat, barley, and oats) and grass, roots, etc., as food for domestic animals. The annual value of the pastures and meadow hay is immense. The total extent of land returned in 1872, as being under all kinds of crops, bare fallow and grass, was 31,004,173 acres in Great Britain, 15,746,547 acres in Ireland, 88,573 in the Isle of Man, 18,026 acres in the island of Jersey, and 12,007 acres in the islands of Guernsey, Alderney, etc., making a total for the United Kingdom of 46,860,326 acres. The number of horses included in the agricultural returns was 1,808,250; the number licensed in Great Britain was 857,048; the number of others than agricultural horses exempt from license duty, was probably about 35,000; and the number belonging to the army at home may be stated at 15,000, which would bring the total number of horses in the United Kingdom up to 2,715,000. The total number of cattle returned for the United Kingdom in 1872, was 9,718,000; sheep, 32,246,000; pigs, 4,178,000.

Constabulary returns, based upon information obtained from farmers and others and received by the Boards of Guardians, show that in the year 1873, Ireland produced 460,563 quarters of wheat, 6,912,765 quarters of oats, 1,016,339 quarters of barley, 25,576 quarters of bere and rye, 48,375 quarters of beans and peas, 2,683,060 tons of potatoes, 4,429,967 tons of turnips, 515,690 tons of mangold wurzel, 278,923 tons of cabbage, 19,843 tons of flax, and 3,306,163 tons of hay. At the end of 1873 Ireland had 4,142,400 head of cattle, 4,482,053 sheep, 532,146 horses and 1,042,244 pigs.

The following table shows the condition of the textile industries of the United Kingdom, 1874:

	NO. OF FACTORIES.	HANDS EMPLOYED.
Cotton,	2,055	479,515
Woolen,	1,800	135,605
Worsted,	692	142,097
Flax,	449	128,459
Silk,	818	45,559
Shoddy,	125	3,431
Hemp,	61	5,211
Jute,	110	37,920
Hair,	27	1,211
Hosiery and other factorys,	557	27,667
Total,	7,294	1,006,675

The government of Great Britain is of the kind known as a "constitutional monarchy," in which the sovereign accepts of his dignity under an express agreement to abide by certain prescribed conditions. The sovereignty is hereditary in the family of Brunswick, now on the throne, and in the person of either a male or a female. The executive government of the United Kingdom is vested nominally in the crown, but practically in a committee of Ministers, commonly called the Cabinet, which has come to absorb the functions of the ancient Privy Council, the members of which, bearing the title of Right Honorable, are sworn "to advise the king according to the best of their cunning and discretion," and "to help and strengthen the execution of what shall be resolved." Though not the offspring of any formal election, the Cabinet is virtually appointed by Parliament, and more especially by the House of Commons, its existence being dependent on the possession of a majority in the latter body.

The powers of Parliament are politically omnipotent within the United Kingdom, its colonies and dependencies. It can make new laws, and enlarge, alter, or repeal those existing. Its authority extends to all ecclesiastical, temporal, civil, or military matters, as well as to altering or changing the constitution of the realm. Parliament is the highest court of law, over which no other has jurisdiction.

The budget estimates for the financial year 1875-76, laid by the Chancellor of the Exchequer before the House of Commons, April 15th, 1875, was as follows:

Total revenue,	£75,685,000
“ expenditure,	75,266,000
“ estimated surplus,	£419,000

The following figures show the numerical strength of the military force in the United Kingdom in 1875:

Cavalry,	13,358
Artillery,	19,418
Engineers,	4,020
Infantry,	55,590
Total,	92,386

The army estimates of March 31st, 1876, contain votes of money for four classes of reserves, as follows:

	MEN.
Militia,	139,018
Yeomanry cavalry,	15,130
Volunteers,	161,150
Enrolled pensioners and army reserve force,	32,000

The total force of the British army in India was stated, in the estimates of 1875-76, to amount to 63,197.

On the 1st of December, 1874, the navy consisted of 233 steamers and sailing vessels, manned by crews aggregating 60,000.

The following are the statistics for the year 1874 of the tonnage of British and foreign vessels (sailing and steam) entered and cleared at ports in the United Kingdom from and to foreign countries and British possessions:

	ENTERED.	CLEARED.	TOTAL.
British,	14,833,644	15,256,039	30,089,683
Foreign,	7,534,866	7,804,408	15,339,274
Total,	22,368,510	23,060,447	45,428,957

There were, in 1874, 20,872 vessels, with crews aggregating 203,606, and of a registered tonnage of 5,864,588.

On the 1st of January, 1875, there were 16,448 miles of railway open in the United Kingdom. The statistics of capital, passengers, receipts, and working expenses for the year 1874 were as follows: Total capital paid up (shares, loans), \$2,970,456,106; number of passengers, 478,316,701; total of traffic receipts, \$277,109,238; working expenses, \$158,040,397.

The number of letters delivered in 1874 was, in England and Wales, 804,000,000, in Scotland, 90,000,000, and in Ireland, 73,000,000. Of postal cards there were 66,000,000 delivered in England and Wales; 9,000,000 in Scotland; and 4,000,000 in Ireland; total for the United Kingdom, 79,000,000.

The number of newspapers and book packets delivered in 1874 was 207,000,000 in England and Wales, 29,000,000 in Scotland, and 23,000,000 in Ireland; total, 259,000,000. The number of money orders in 1874, in the whole of the United Kingdom was 15,900,562, of the aggregate value of £26,296,441. At the end of the year the total amount of deposits held by the Post Office Savings Bank was £24,030,711.

There were 19,116,634 telegraph messages forwarded from postal telegraph stations in the year 1874. The number of post offices at the end of 1874 was 12,950. The total number of telegraph offices, at the same date, was 5600, including 1800 railway telegraph offices. The total length of the postal telegraph wires at the end of 1874 was 107,000 miles.

In England, the chief institutions for education are the ancient national universities of Oxford and Cambridge; the more recent institutions of London, Durham, and Lampeter, in Wales; the classical schools of Eton, Westminster, Winchester, Harrow, Charter House, and Rugby; Owens College, Manchester, and other colleges and schools, chiefly for physical science; the various military schools; the colleges of the dissenting denominations; the middle class schools, either started by individual teachers or by associated bodies acting as directors, to whom the teachers are responsible; and the schools of design.

For primary education, a national system has now been established. Under the Elementary Education Act for England, 1870, a popularly elected school board is established in any district where the existing schools are deficient. Schools under the act are supported by school-rates and fees, and by parliamentary grants, varying according to the number of pupils, and their proficiency, as tested by different standards of examination. They are at all times to be open to government inspection. It is left to the discretion of school boards to make education compulsory.

Scotland possesses four universities for the higher branches of education, viz.: Edinburgh, Glasgow, St. Andrew's, and Aberdeen, besides a variety of other minor colleges. The Scotch education act, 1872, is modelled after the English act, but differs from it by enacting that a school board is to be elected in *every* parish and burgh; by making it illegal for parents to omit educating their children, between five and thirteen, in reading, writing, and arithmetic; and by comprehending higher class schools.

The number of the day-schools in Great Britain, inspected in 1871, was 10,700; the daily average attendance throughout the year was 1,434,488; 1,724,689 scholars were present at inspection; 875,298 were examined; and 598,203 passed the prescribed tests. On the registers of the inspected day-schools were 2,055,312 children, of whom 517,344 were under six years of age, 1,332,229 between six and twelve, and 205,739 above twelve; 2709 night-schools, were inspected, having an average attendance of 86,206 each night. In December, 1871, there were in Great Britain 15,605 certificated teachers, 1196 assistant teachers, and 21,854 pupil teachers.

Ireland is well supplied with educational establishments, having three universities, a large number of endowed schools, and an admirable system of mixed schools.

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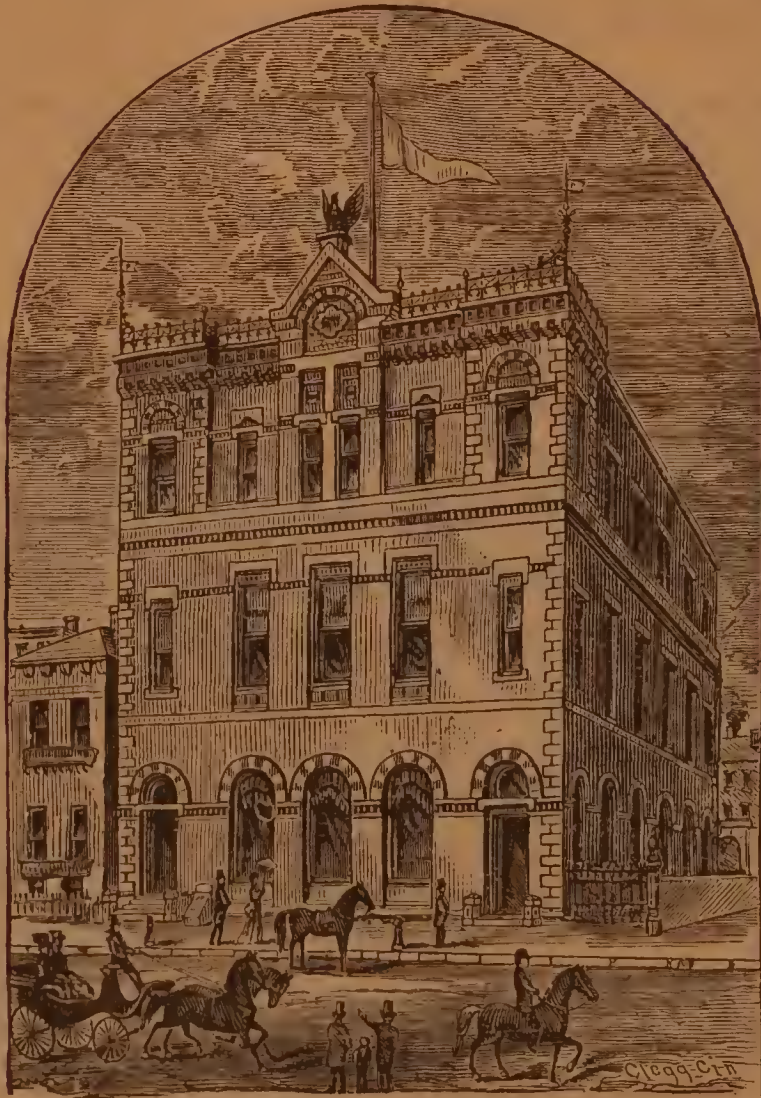
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GREAT BRITAIN.

Minerals, Ores, Stone, Mining and Metallurgical Products.

Minerals, Ores, Stone, Mining Products.

- 1 West Cumberland Iron & Steel Co. (limited), Workington, Cumberland.
a Iron ores. 100
b Coal and coke. 101
c Limestone. 103
- 2 Wigan Coal & Iron Co. (limited), Wigan, Lancashire, England.—Cannel and gas coal. 101
- 3 Penrose & Richards, Swansea, South Wales.—Coke fuel. 101
- 4 Dixon, Frederick, London, E. C.—Patent fuel. 101
- 5 Dudgeon, Arthur, Westminster, London.—Peat fuel manufactured by the Irish Peat Fuel Co. 101
- 6 Lindley, Robert Charles, Mansfield, Nottinghamshire.—Stones from the Mansfield quarries. 102
- 7 Cwmorthin Slate Co. (limited), Portmadoc, North Wales.—Roofing slates. 102
- 8 Hunter, James, Aberdeen, Scotland.—Red polished granite monument. 102
- 9 Macdonald, Field, & Co., Aberdeen, Granite Works, Aberdeen, Scotland.—Polished red granite monument. 102
- 10 Penyrorsed Slate Quarry Co. (limited), Carnarvon, North Wales.—Roofing slates, slate slabs, cisterns, ridges for roofs, billiard slabs, slate partly manufactured. 102
- 11 Shearer, Smith, & Co., Dalbeattie Granite Quarries, Scotland.—Scotch polished granite, and street paving blocks. 104
- 12 Bessbrook Granite Works, Bessbrook, Ireland.—Blue and gray Irish granites in headstones, monuments, and building work. 102
- 13 Great North of Scotland Granite Co. (limited), Peterhead, Scotland.—Monumental pedestal and vase in polished red granite. 102
- 14 Hollick & Co., Greenwich, London.—Portland cement. 103
- 15 Patent Selenitic Cement Co. (limited), London.—Method of preparing lime for mortar, for plastering and brickwork, and also for concrete. 103
- 16 Wouldham Cement Co., Wouldham-on-the-Medway, Kent, England.—Portland cement and its ingredients in different stages of manufacture. Concrete blocks and other objects made therefrom. 103

- 17 Lavers, Alfred Hamilton, London.—Portland cement, test blocks, cements, plaster of Paris, whiting. 103
- 18 Francis & Co., Cliffe Creek, Rochester.—Cements, cement concrete, parian scagliola, and decorated parian. 103
- 19 Grays Chalk Quarries Co. (limited), Grays, Essex.—Chalk, whiting, kilndried chalk, gilders' whiting, flint. 103
- 20 Eastwood & Co. (limited), London.—Portland cement; building, paving, ornamental, and fire bricks; Staffordshire blue bricks, and grooved paviers, red paving, roofing tiles, ridges, and clinkers. 103
- 21 Pike, William Joseph, Wareham, Dorsetshire.—Clays. 104
- 22 Harrison, George King, Lye and Brettell Lane Fire Clay Mines and Brick Works, Stourbridge, England.—Stourbridge fire clays. 104
- 23 Dunn, Robert, & Co., St. Austell, Cornwall.—China clay, in its raw material; samples for potting, bleaching, paper manufacturing, etc. 104
- 24 Oakey, John, & Sons, Wellington Mills, London.—Crude emery stone; grain emery; flour emery. 106

Metallurgical Products.

- 25 Johnson, Matthey, & Co., London.—Articles in platinum; rare and precious metals. 110
- 26 Wigan Coal & Iron Co. (limited), Wigan, Lancashire.—Hematite, foundry and forge pig iron. 111
- 27 Biggs, John, Liverpool.—Iron and steel produced by a new process. 111
- 28 West Cumberland Iron & Steel Co. (limited), Workington, Cumberland.—Pig iron, spiegeleisen, granulated blast furnace slag, Bessemer steel in the ingot; steel forgings, rails and rail sections; boiler and bridge plates, railway chairs, etc.; samples illustrating the testing of steel, and its metallurgy. 111
- 29 Smith, Frederick, & Co., Caledonia Works, Halifax, Yorkshire.—Rope, rigging, telegraph, card, reed, and bonnet wire; iron in its various stages of manufacture into wire. 111
- 30 Houghton, William Dickson, Warrington.—Wire for special and general purposes. 111
- 31 Edge & Sons, Coalport Works, Shropshire.—Wire ropes and chains for mining and engineering purposes. 111

Metallurgical Products.

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| <p>32 Ash & Lacy, Globe Works, Staffordshire.—Galvanized, tinned, plain, and corrugated iron sheets; perforated zinc and metals, etc. 111</p> <p>33 Cammell, Charles, & Co. (limited), Cyelops Steel & Iron Works, Sheffield.—Rolled iron armor plates. 111</p> <p>34 Siemens, Charles William, London.—Specimens of iron and steel. 111</p> <p>35 Baldwin, E. P. & W., Wilden Works, near Stourport.
 <i>a</i> Button and sheet iron black plates. 111
 <i>b</i> Tin and terne plates; tinned sheets. 113</p> <p>36 Brown, John, & Co. (limited), Atlas Steel & Iron Works, Sheffield.—Armor plates; naval engineering. (<i>In Machinery Hall.</i>) 111</p> | <p>37 Swansea Tin Plate Co., The Tin and Terne Plate Manufacturers, Swansea Tin Plate Works, Swansea.—Tin and terne plates. 113</p> <p>38 Nash, Henry, & Co., Liverpool.—Tin and terne plates, black plate, and patent continuous roofing terne plate. 113</p> <p>39 Governor and Company of Copper Miners in England, The, Glamorganshire, S. W.—Tin and terne plates. 113</p> <p>40 Morewood, E., & Co., Llanelly.
 <i>a</i> Tin and terne plates. 113
 <i>b</i> Machines for manufacturing tin and terne plate and galvanized sheet iron. 512</p> <p>41 Phosphor Bronze Co. (limited), London.—Phosphor bronze tools, locks, keys, tubes, wire, sheet, steam fittings, parts of machinery. 114</p> |
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NEW SOUTH WALES.—STATISTICAL PREFACE.

NEW SOUTH WALES, a British colony in the southeastern portion of Australia, is bounded on the north by a line which, beginning at Point Danger, in latitude $28^{\circ} 8'$ south, follows several lines of heights across the Dividing Range till it meets the 29th parallel, which forms the rest of the boundary westward; on the west by the 141st meridian; on the east by the Pacific Ocean; and the line separating it from Victoria on the south runs from Cape Howe, at the southeast of the island, northwest to the source of the Murray, and then along that stream, in a direction west by north, to the western boundary of the two colonies.

Its area is 323,437 square miles, and its population in 1871 was, exclusive of aborigines, 503,981. At the same date the population of Sydney, the capital, was 134,755. Within the colony of New South Wales, the mountain range, which girdles nearly the whole island, is most continuous and elevated, and is known as the Dividing Range. The section of this mountain system on the southern boundary of the colony, called the Australian Alps, rises in Mount Koseiusko to 6500 feet. From this the range extends northward, the water-shed being from 50 to 150 miles distant from the east coast, and thus divides the colony into two slopes, with two distinct water systems. The rivers on the eastern side descend with great rapidity, and in oblique tortuous courses, their channels often forming deep ravines. Many of them are navigable in their lower course for sea-going steamers. The principal are the Richmond, Clarence, McLeay, Manning, Hunter, Hawkesbury, and Shoalhaven. The numerous streams that rise on the west side of the water-shed within the colony, all converge and empty their waters into the sea through one channel within the colony of South Australia. The southern and main branch of this great river system is the Murray. The other great trunks of the system are the Murrumbidgee, which is navigable, the Lachlan, at times reduced to a string of ponds, and the Darling. The Macquarie, passing through the rich district of Bathurst, is a large tributary of the Darling, but it reaches it only in the rainy seasons. The coast line from Cape Howe to Point Danger is upwards of 700 miles long, and presents numerous good harbors formed by the estuaries of the rivers. Owing to the great extent of the

colony, stretching as it does over eleven degrees of latitude, the climate is very various. In the northern districts, which are the warmest, the climate is tropical, the summer heat occasionally rising in inland districts to 120° , while on the high table-lands weeks of severe frost are sometimes experienced. At Sydney, the mean temperature of the year is about 65° . The mean heat of summer, which lasts here from the beginning of December to the 1st of February, is about 80° , but it is much modified on the coast by the refreshing sea breeze. The annual fall of rain is about 50 inches. Rain sometimes descends in continuous torrents, and causes the rivers to rise to an extraordinary height. Sometimes the rains almost fail for two or three years in succession. Along the coast, for 300 miles from the northern boundary, the soil and climate are admirably adapted for the growth of cotton, and that plant has already been cultivated as far south as the river Manning (latitude 32° south). Further south the climate is more temperate, and is fitted to produce all the grain products of Europe. Immense tracts of land, admirably adapted for agriculture, occur in the southwestern interior; while in the southeast coast districts, the soil is celebrated for its richness and fertility. In the north, the cotton and tobacco plants, the vine, and sugar-cane are grown; and pineapples, bananas, guavas, lemons, citrons, and other tropical fruits are produced. In the cooler regions of the south, peaches, apricots, nectarines, oranges, grapes, pears, pomegranates, melons, and all the British fruits are grown in perfection, and sometimes in such abundance that pigs are fed with them. Wheat, barley, oats, and all the cereals and vegetables of Europe are also grown.

In June, 1872, New South Wales had 5,615,054 sheep, 2,271,923 horned cattle, 233,220 horses, and 146,091 pigs. The total area of land under cultivation, at the same date, embraced 297,575 acres, of which there were under wheat, 154,030 acres, under barley, 3462 acres, under oats, 13,795, under rye, 1342, under maize, 119,956.

New South Wales is believed to be richer in coal than the other territories of Australia. In 1873, there were 26 mines worked, producing in the year 1,192,861 tons of coal, valued at £665,746.

The gold mines of New South Wales cover a vast area, extending chiefly over the districts called the Western Fields, the Northern Fields, and the Southern Fields. Of these the Western Fields are the most important, furnishing three-fourths of the total supply. The gold exports of 1873 consisted of 200,134 ounces, value £773,439, of gold dust and bar, and of 490 boxes, value £2,151,168, of gold coin. The yield from the copper mines, in 1873, was 6027 tons.

The total exports during the year 1874 were £8,668,113; imports, £9,259,816.

The constitution of New South Wales vests the legislative power in a Parliament of two houses, the first called the Legislative Council, and the second the Legislative Assembly. The Legislative Council consists of not less than 21 members, nominated by the crown, and the Assembly of 72 members, elected by sixty constituencies. To be eligible a man must be of age, a natural-born subject of the Queen, or, if an alien, he must have been naturalized for five years, and resident for two years before election. There is no property qualification for electors, and the votes are taken by secret ballot. The executive is in the hands of a governor, nominated by the crown.

The public revenue during 1874 was £4,200,827, the expenditure, £3,506,780. The public debt, chiefly incurred for railways and other public works, amounted, at the end of 1874, to £10,842,415.

New South Wales possesses 396 miles of railways. Of electric telegraph, there were in the colony 6114 miles of wire, at the end of 1874. Number of paid messages transmitted during 1874, 385,000; number of telegraph stations, 105.

The post office of the colony transmitted 9,300,000 letters, 4720 newspapers, and 250,000 packets in 1874.

The number of schools, public and private, in 1872, was 1464, with 106,691 pupils.

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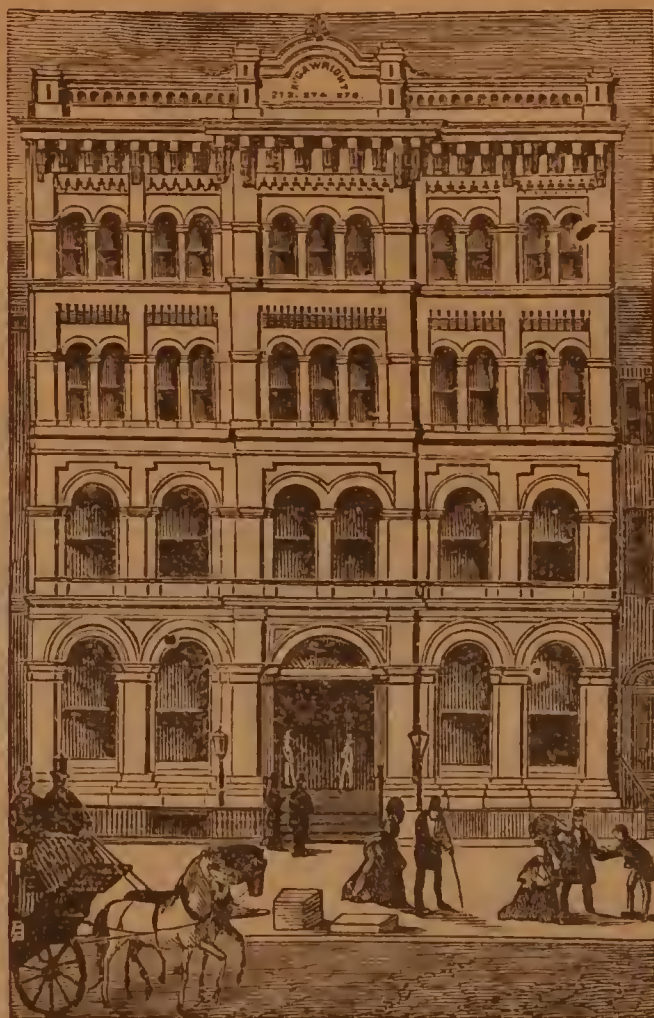
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NEW SOUTH WALES.

(North of Nave, Columns 10 to 17.)

Minerals, Mineral and Metallurgical Products, Engineering.

Minerals, Ores, Stone, Mining Products.

- 1 McCallum, Argyle, Yaas.—Copper and lode ores from Woolgarloo Mine; iron ore from Bogolong. 100
- 2 Stuart, Seymour C.—Auriferous quartz from Adelong; lode and stream tin ore. 100
- 3 King, P. G., Goonoo.—Sulphuret of antimony, from Nundle. 100
- 4 Howard, John, Sofala.—Antimony, from Crudine creek. 100
- 5 Coulter, Edward, Sydney.—Magnetic iron ore containing gold and copper, from Mount Lambie. 100
- 6 Department of Mines, Sydney.
 - a Mineralogical and geological collection; specimens of gold from the Southern, Western, and Northern districts; models of gold nuggets found in New South Wales; gold trophy, showing production of New South Wales. 100
 - b Coal trophy. 101
- 7 Government Printing Office, Sydney, New South Wales.—Mineral and rocks. 100
- 8 Fountain, John, Gosford, Brisbane Water.—Iron ore from Brisbane Water. 100
- 9 King, P. G., Goonoo Goonoo.—Lepidodendron fossils from Goonoo Goonoo. 100
- 10 Wilson, W., Monaltrie, Richmond River.—Fossils. 100
- 11 Butchart, J. Hawkins, Sydney.—Lode and stream tin ore. 100

- 12 Caddell, Alfred, Sydney.—Tin ore and wash dirt from Vegetable Creek Tin Mines. 100
- 13 New South Wales Shale and Oil Company, Sydney.—Kerosene shale. 101
- 14 Towns, R., & Co., Sydney.—Kerosene shale from Murrurundi. 101
- 15 Browne, Thomas, Bishop's Bridge.—Sandstone from West Maitland. 102
- 16 Douglass, W., Sydney.—Slate from a quarry near Goulburn. 102
- 17 Young, John, Sydney.—Granite from Moruya, and marble. 102
- 18 Mackintosh & Oakes, Bathurst.—Kaolin. 104
- 19 Warden, David, Ulladulla.—Kaolin. 104

Metallurgical Products.

- 20 New South Wales Commissioners.—Copper ingots. 112
- 21 Moore & Co., Sydney.—Tin ingots. 113
- 22 Vegetable Creek Company, Sydney.—Tin ingot. 113
- 23 New South Wales Commissioners.—Tin ingots, bars, and grain tin. 113
- 24 Bensusan, J. L., Sydney.—Tin. 113

Mining Engineering.

- 25 Caddell, Alfred, Sydney.—Model of shaft of Vegetable Creek Tin Mine, and report, plan, and photographs. 121
- 26 Government Printing Office, Sydney, New South Wales.—Mines and mineral statistics. 121

VICTORIA.—STATISTICAL PREFACE.

VICTORIA comprises the southeast corner of Australia, at that part where its territory projects furthest into cool southern latitudes. Wilson's Promontory, to the southeast, the most southerly headland, just passes the 37° of south latitude, while the most northern point, which is at the opposite or northwest extreme, is in south latitude 34°. The longitude comprises 9°,—between 141° and 150° east of Greenwich. To the west is the colony of South Australia, separated by the 141° of east longitude, to the north is New South Wales, separated by the line of the Murray river eastwards from 141° east longitude to its source, and thence by a straight line southeast to Cape Howe, and from Cape Howe to South Australia again the colony is bounded on the south by Bass's Strait. The extreme length is east and west, and

is about 500 miles, by an extreme width north and south of 300 miles. But a remarkable indentation of both the north and south boundaries opposite each other, about the middle of the colony, reduces the breadth between the head of the Port Phillip inlet and the Murray to only 120 miles. The superficial area is 88,198 English square miles.

Although Victoria may be called mountainous, as compared with the general flatness of Australia, it has much of the quiet and peculiar scenery characteristic of that division of the world. The highest mountain in Australia, Mount Feathertop, is 6303 feet in height. The largest river, which runs throughout its entire course in Victoria, is the Gouldbourn, 230 miles long. The Murray, which winds for a distance of 630 miles along the northern boundary of Victoria, rises in New South Wales, and falls into the sea in South Australia, so that it can scarcely be called a Victorian river.

The climate is on the whole healthful and agreeable, but subject to frequent and sudden change in condition and temperature. The average temperature of Melbourne is 57.6° , about the same as that of Marseilles, Bordeaux, Bologna, Nice, and Madrid. The common summer heat is from 65° to 80° , with an occasional advance to 90° , and even to 100° , during hot winds and a dry season. The winter range is mostly from 45° to 60° . Ice occurs in the midwinter of July, but it rarely, except on elevated ground, survives the noonday sun.

The estimated population of Victoria, on the 31st of March, 1875, was returned at 810,442 by the Registrar-general.

In 1875 there were 1,011,776 acres under crops, including 332,936 acres of wheat, 114,921 of oats, 29,505 of barley, 35,183 of potatoes, 119,031 of hay, and 253,129 of green forage. The gross produce was: wheat, 4,850,165 bushels; oats, 2,121,612 bushels; barley, 619,896 bushels; potatoes, 124,310 tons; hay, 157,261 tons; wine, 577,493 gallons. The total number of horses was, in 1875, 180,254; milch cows, 241,137; horned cattle, 717,251; sheep, 11,221,036; pigs, 137,941. The manufactures of Victoria employed 25,000 persons, and the capital invested in machinery and plant was £5,000,000. The number of persons at work in the gold fields, December 31st, 1874, was 45,151, of whom 12,180, or 27 per cent., were Chinese.

The total value of the imports and exports of Victoria, including bullion and specie, for the year 1874, was as follows: Imports, £16,953,985; exports, £15,441,109. The most important, in value, of the imports are woollens, live stock, sugar, cotton, apparel and haberdashery, and tea. The two staple articles of export are wool and gold. The total exports of wool in 1874 amounted to 88,662,311 pounds, of the value of £6,373,641. The exports of gold, exclusive of specie, was 1,012,153 ounces, of a declared value of £4,053,288.

The number of mercantile vessels on the register of Victoria, at the end of 1874, was 429, with a total tonnage of 70,696, and crews of 3229 men. Of these vessels 47 were steamers.

The constitution of Victoria was established by an act passed by the legislature of the colony in 1854, and subsequently confirmed by the crown. The legislative authority is vested in a parliament of two chambers—the Legislative Council, composed of 30 members, and the Legislative Assembly, composed of 78 members. A property qualification is required both for members and electors of the Legislative Council. No electoral property qualification is required for graduates of British universities, matriculated students of the Melbourne university, religious ministers of all denominations, certificated schoolmasters, lawyers, medical practitioners, and officers of the army and navy. Six members, or a fifth, of the Legislative Council must retire every two years, so that a total change is effected in ten years. The members of the Legislative Assembly are elected by universal suffrage, for the term of three years. The executive is vested in a governor, appointed by the crown. The revenue for the year 1874–75 was £4,406,906; the expenditure, £4,425,277. The public debt, incurred mainly in the construction of public works, amounted to £12,485,432 on January 1st, 1875.

Victoria has a more extensive system of railways than any other of the Australasian colonies. On the 1st of January, 1875, there were 457½ miles opened for traffic, and 427 more in course of construction. There were, in 1874, 148 telegraph stations, 4464 miles of wires. Number of telegrams forwarded during the year, 701,080. The work of the post office during the same year, 15,732,828 letters, 6,866,918 newspapers, and 1,269,822 packets. Number of post offices, 802.

The following table shows the educational condition of the population above five years of age :

	MALES.	FEMALES	TOTAL.
Able to read and write,	264,665	209,898	474,665
Able to read only,	30,049	36,336	66,385
Unable to read,	25,462	26,315	51,077

The state of education among the children, between 5 and 15, showed that 846 children out of 1000 could read, 640 could read and write, and only 154 were totally uninstructed. Education in Victoria is gratuitous, secular, and compulsory, and the legislature has voted large sums for the primary education of the people.

The total number of schools is 1867, including 908 "common" schools, with an attendance of 154,353 pupils. (Furnished, in part, by the Victoria Commission.)

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VICTORIA.

(North of Nave, Columns 10 to 17.)

Minerals, Precious Stones.

Minerals, Ores, Stone, Mining Products.

- 1 Collection of Rocks, Minerals, and Fossils, illustrative of the geology, mineralogy, and mining resources of Victoria, exhibited for, and on behalf of the Government, by R. Brough Smyth, F. G. S., F. L. S., Assoc. Inst. C. E., Secretary for Mines, and Chief Inspector of Mines for the colony. 100
- a Older igneous or plutonic rocks.
- b Newer igneous or volcanic rocks.
- c Aqueous rocks.
- d Upper silurian.
- e Upper palæozoic.
- f Mesozoic-carbonaceous.
- g Tertiary.
- h Collection of mineral specimens.
- i Economic collection: auriferous quartz.

- k Fac-similes of gold nuggets found in Victoria.
- l Economic minerals.
- m Fossil fruit.
- 2 Acadia Catherine Gold Mining Company, Sandhurst.—Golden stone. 100
- 3 Bleasdale, J. I., Melbourne.—Collection of gems and precious stones, consisting of diamonds, blue sapphires, oriental emeralds, rubies, aqua-marines, topazes, spinels, beryls, opals, garnets, tourmalines, etc. 100
- 4 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Fac-similes of nuggets found in Victoria, and mineralogical and geological specimens. 100
- 5 Costerfield Gold and Antimony Mining Co., Melbourne.—Antimony ore. 100

Minerals, Metallurgical Products, Mining Engineering.

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| <p>6 Hanckar, J. H. H., Melbourne.—Nickel ore from the Boa Kaine Mine, New Caledonia. 100</p> <p>7 McGie, James, & Co., Melbourne.—Nickel ore. 100</p> <p>8 Shenandoah Gold Mining Co., Sandhurst.—Gold-bearing quartz. 100</p> <p>9 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Coal. 101</p> <p>10 Mining Department of Victoria, Melbourne.—Coal. 101</p> <p>11 Commissioners for Victoria, to the Philadelphia Exhibition, Melbourne.—Sawn slate, block of granite, polished marble. 102</p> <p>12 Mansfield Shire Council, Mansfield.—Polished marble, hewn sandstone. 102</p> <p>13 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.</p> <p style="padding-left: 20px;">a Limestones from Major Plains. 103</p> <p style="padding-left: 20px;">b Black clay, clay and sand; kaolin clay. 104</p> <p style="padding-left: 20px;">c Sharpening stones from Wangunyah. 106</p> <p>14 Arthur & Dogherty, New Zealand.—Lithographic stone, 106</p> | <p>15 Lewis & Whitty, Fitzroy.—Knife polish. 106</p> <p>16 Hattersley, J., Yackandandah.—Aerated waters. 107</p> <p>17 Lyon, George, Spring Creek, Beechworth.—Lemonade, soda water, and ginger ale. 107</p> <p>18 Rowlands & Lewis, Ballarat and Melbourne.—Tonic potass, soda, lithia, and seltzer waters, and ginger ale. 107</p> |
|--|--|

Metallurgical Products.

- | | |
|--|--|
| <p>19 Bright Bros. & Co., Melbourne.—Star antimony in ingots. 113</p> <p>20 Costerfield Gold and Antimony Mining Co., Melbourne.—Antimony. 113</p> <p>21 Hodgson, Richard, Collingwood.—Star antimony, pig lead, block tin. 113</p> <p>22 Croaker, Scott, & Co., Melbourne.—Star antimony. 113</p> | |
|--|--|

Mining Engineering.

- | | |
|--|--|
| <p>23 Smyth, R. Brough, Department of Mines, Melbourne.—Geological maps, reports, etc. 121</p> | |
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NEW ZEALAND.—STATISTICAL PREFACE.

NEW ZEALAND, a British colony in the South Pacific Ocean, consists of three principal islands, called, respectively, the North, South, and Stewart Islands. There are several small islets—mostly uninhabited—dependent on the colony; the chief of them are the Chatham Islands and the Auckland Islands. The New Zealand group is situated about 6500 miles west of South America, and about 1200 miles east of Australia. The entire group lies between 34° and 48° south latitude and 166° and 179° east longitude. The three principal islands extend in length 1100 miles, but their breadth is extremely variable, ranging from 46 miles to 250 miles; the average breadth being about 140 miles. The North and South Islands are separated by Cook Strait, which is crossed by steamers in about two hours.

The total area of New Zealand is about 100,000 square miles, or 64,000,000 acres.

According to a census taken March 31st, 1874, the population (exclusive of the aborigines) numbered 299,514 souls. It is estimated that the present white population (April, 1876) is about 400,000. The Maori population, according to an approximate census taken on June 1st, 1874, was 45,470.

The aborigines, called Maoris, who formerly caused much trouble, though a large number have always sided with the British, are now peacefully settling down to agricultural pursuits, and, since 1871, permanent tranquility appears to have been established.

The New Zealand Islands are of volcanic origin, and a great portion of the entire area is occupied by mountains, among which are many extinct and a few active volcanoes. The mountains are mostly clothed with evergreen forests of luxuriant growth, interspersed with fern-clad ranges, and occasionally with treeless grassy plains. Extensive and rich valleys and sheltered dales abound in the North Island; and in the east of the South Island there are many extensive plains of rich meadowland, admirably adapted either for agriculture or cattle-breeding. Water and water-power are found in great abundance in the colony, and the numerous rivers are

subject to sudden floods from the melting of the mountain snows. As a rule, however, the streams are short, and are not navigable for more than 50 miles above their mouths. The chief is Waikato river, in the North Island, which, issuing from the Taupo lake (30 miles long by 20 broad), flows in a northern direction for 200 miles, and reaches the sea on the west coast. In the South Island, the rivers Clutha, Mataura, and Waiau, all flowing south, are among the chief.

In the North Island, around Lakes Rotomahana and Rotorua, are a number of grand and beautiful geysers, which throw up water heated to two degrees above the boiling point. The southwest coast of the South Island is indented with a number of deep sounds, of which Milford Sound is the chief. In this sound the water is unfathomable; the only way of securing a ship being to moor it, stem and stern, to the trees which overhang the water. Steamers of 2000 tons have been thus moored. The geology of New Zealand is remarkable in a high degree. The mountains, which are of every variety of outline, are chiefly composed of the lower slate-rocks, intersected with basaltic veins, primary sandstone, and limestone. Extensive beds of coal and lignite exist; the former have been to some extent worked, and are at present being largely developed by the construction of railways and harbor works in their vicinity.

Of the whole surface extent of New Zealand, one-fourth is estimated to consist of dense forest tracts, one-half of excellent soil, and the remainder of waste lands, scorix hills, and rugged mountain regions. Nearly 40,000,000 acres are supposed to be more or less suitable for agriculture and cattle-breeding. The soil, though often clayey, has in the volcanic districts more than a medium fertility; but the luxuriant and semi-tropical vegetation is perhaps as much due to excellence of climate as to richness of soil. Owing to the prevalence of light and easily worked soils, all agricultural processes are performed with unusual ease. The climate of New Zealand is one of the finest in the world. The country contains few physical sources of disease; the average temperature is remarkably even at all seasons of the year, and the atmosphere is continually agitated and freshened by winds that blow over an immense expanse of ocean. In the North Island, the mean annual temperature is 57°; in the South Island, 52°. The mean temperature of the hottest month at Auckland, in the northernmost province, is 68°, and at Dunedin, in the most southern province, 58°; of the coldest month, 51° and 40° respectively. The air is very humid, and the fall of rain is greater than in England, but there are more dry days. All the native trees and plants are evergreens. Forests, shrubberies, and plains are clothed in green throughout the year, the results of which are, that cattle, as a rule, browse on the herbage and shrubs of the open country all the year round, thus saving great expense to the cattle-breeder; and that the operations of reclaiming and cultivating land can be carried on at all seasons. The seasons in New Zealand are the reverse of ours; January is their hottest month, and June the coldest. All the grains, grasses, fruits, and vegetables grown in England are cultivated in the colony with perfect success, being excellent in quality and heavy in yield; while, besides these, the vine is cultivated in the open air, and maize, the taro (*Caladium esculentum*), and the sweet potato are cultivated with success in the sunny valleys of the North Island.

The entire average under crop, in February, 1875, was 1,788,800. Of the crops, the principal were wheat, oats, barley, potatoes, and sown grass. At the same date, the number of holdings was 16,092, the population being 296,018. The average yield of wheat was, in 1875, over 28 bushels per acre.

The live stock of the colony consisted, at the census of March 1st, 1874, of 99,859 horses, 494,917 cattle, 11,704,853 sheep, 123,921 pigs, and 1,058,198 head of poultry.

Large gold fields were discovered in the spring of 1857. In the year 1874, there were 376,388 ounces of gold, of the declared value of £1,505,331, exported from New Zealand, being little more than half the amount and value exported in 1871, while

from April 1st, 1857, to December 31st, 1874, the total quantity of gold exported was 7,599,973 ounces, valued at £29,577,016 sterling.

The principal produce of the colony is wool, 46,848,735 pounds, valued at £2,834,695, having been exported in 1874.

The total imports of the colony during the year 1874 were £8,121,812; the total exports, £5,251,269.

The temperature, it will be thus observed, is very equable, for while the summers are as cool as those of England, the winters are as warm as those of Italy. The mean annual temperature of Auckland is nearly the same as at Rome; at Wellington, nearly the same as at Milan; at Dunedin, nearly the same as at London. The official reports of the British Army Medical Department shows that, where the annual mortality from all diseases out of every 1000 British soldiers quartered in the United Kingdom was 16, it was only 5 out of every 1000 in the troops quartered for more than 25 years in New Zealand. In other words, this colony appears to be peculiarly favorable to the duration of human life.

In connection with this, it may be mentioned, in order to show the redundancy of the population in New Zealand, that in 1874 the births were 40.05 per 1000 of the population, and the death rate was only 12.97 per 1000, while the marriages were 8.81 for every 1000 people.

The class of people most required in New Zealand are farmers with a small capital, carpenters, who can earn, according to their skill, from 11 shillings to 15 shillings per diem, and single women, who always gain good wages, and rarely stop in service for a long time, being greatly in demand in the matrimonial market. All classes of laborers find ready employment at remunerative rates.

By an imperial statute, passed in 1852, the legislative power is vested in the Governor and a Parliament of two chambers; the first called the Legislative Council, and the second the House of Representatives, and collectively, the General Assembly. The Legislative Council consists at present of 49 members, nominated by the crown for life; and the House of Representatives of 83 members, elected by the people for five years. Two Maoris sit in the Legislative Council, and 4 in the House of Representatives. Two of the latter also are members of the Executive Council. The Governor is assisted by an Executive Council, composed of the responsible ministers for the time being, and any others he may appoint. Members of both branches receive pay at the rate of 150 guineas for the session, which generally lasts three months. Every owner of a freehold worth £50, or tenant householder, in the country at £5, in the town at £10 a year rent, is qualified to vote for members of the House, and is eligible for membership. The seat of government is at Wellington, a town of about 12,000 people, and centrally situated.

The colony is divided into nine provinces; four in the North, and five in the South Islands. Each of these provinces is governed by an elected Superintendent and Provincial Council. In 1875, the General Assembly passed a bill declaring that the provincial governments should cease to exist after the close of their next session. The form of local government which is to take the place of provincial government has not been decided upon, but will probably take the shape of legislative powers.

In the year 1874, the total ordinary revenue (including provincial) was £1,873,448, and the territorial revenue, £1,150,900, which, with incidental receipts of £44,264, makes the total general revenue—ordinary, territorial, and incidental—amount to £3,068,612. The total ordinary expenditure by general and provincial governments was £2,960,711.

Beyond the ordinary expenditure, a sum of £2,725,893 was spent, which is charged to the loan account. The public debt of New Zealand amounted, at the end of 1874, to £13,366,936, and as a loan expenditure is still proceeding, it is estimated that the total debt will shortly amount to about £19,000,000. Against this there is a sinking fund already amounting to £1,000,000, and, moreover, a large amount has been

spent on reproductive works. In 1870, the sum of £4,000,000 was authorized to be borrowed for the purposes of emigration and public works (such as railways, roads, telegraphs, water-races, bridges, etc.), besides £1,000,000 for defence and other purposes. Since then, further large loans have been contracted for public works. To assist in the development of these works, a vast number of emigrants have been brought into the country, receiving either free passage from England or a grant of land. Railways are now being constructed throughout the islands, 260 miles being open for traffic; 420 miles under construction, of which a good deal is near completion; and 330 miles are authorized to be constructed.

Under the stimulus of the public works and emigration policy, no less than 43,965 emigrants arrived in New Zealand in 1874.

On the 31st of December, 1874, the colony had 2632 miles of telegraph lines, and 5284 miles of wires. The number of telegrams during the year was 844,301, of which total 724,582 were private, and the remainder government messages.

During the year 1874, the post office received 4,339,165 letters, and dispatched 4,719,291. The total number of newspapers received was 3,872,668, and dispatched, 2,434,024. Money orders to the number of 62,712 and the amount of £263,164 were issued during 1874.

Grammar and free schools, endowed from the public revenues of the various provinces, several colleges, and two universities, one being established in Otago and the other a corporation endowed by the general government, are the principal educational institutions.

The shipping entered in 1874 consisted of 856 vessels, with a tonnage of 399,296. Of these, 237 vessels, measuring 201,017 tons, were British; 552, measuring 170,303 tons, colonial; and 67, measuring 27,976, were foreign. Of the foreign vessels entered, 50 were American. Coasters are not included in the above statistics. In 1874 the number of vessels entered coastwise was 14,351, and their tonnage 1,353,085.

Commission from NEW ZEALAND to the International Exhibition:

THE HON. WALTER BALDOCK DURANT MANTELL, M. L. C., Chairman.

THE HON. WILLIAM SISBORNE.

WILLIAM HORT LEVIN, ESQ.

DANIEL MCINTYRE, ESQ., Consular Agent of the United States Government at Wellington.

JAMES HECTOR, ESQ., C. M. G., M.D., F. R. S., Resident Commissioner.

ARTHUR THOMAS BOTHAMLEY, Secretary.

NEW ZEALAND.

(North of Nave, Columns 10 to 17.)

Minerals, Stone, Metallurgical Products.

Minerals, Ores, Stone, Mining Products.

- 1 Parapara Iron and Coal Co., Nelson.
 - a Brown hematite ore. 100
 - b Coal from the Avrere river. 101
 - c Limestone used as a flux for hematite ore. 103
- 2 Johnstone Bros., Nelson.—Hematite iron ore. 100
- 3 Nelson Committee, Nelson.
 - a Iron, plumbago, galena, zinc blende, copper, antimony, and argentiferous lead ores. 100
 - b Coal from Coalbrookdale, Mount Rochfort, and Reefton. 101
 - c Marble from Ruatanuka, Golden Bay. 102
 - d Porcelain clays from Pakawan and Ruatanuka; steatite from Golden Gully, Collingwood. 104
- 4 Louisson, T. B., Nelson.—Iron ore, calcined iron ore. 100
- 5 Washbourn, W. E., Nelson.—Argentiferous lead ore. 100
- 6 Taranaki Committee.—Titanic iron sand, older tertiary marl, trachyte pebble, trachyte with crystals of hornblende, trachyte cast, hornblende, obsidian, nephrite, taranakite, carnelian. 100
- 7 Colonial Museum, Wellington.
 - a Collection of minerals, etc., arranged by James Hector, containing magnetic iron, hematite, chrome, copper, lead, zinc, and manganese ores. 100
 - b Specimens illustrating the classification of New Zealand coals; petroleums from Sugar Loaf Point, Waiapee, Waipawa. 101
 - c Marble from Collingwood, Nelson. 102
 - d Steatite from Parapara Valley, Nelson. 104
- 8 Kennedy Brothers, Nelson.
 - a Coal from the Brunner Mine, and coke manufactured from it. 101
 - b Raw and ground fire clay. 104
- 9 Albion Coal Co., Nelson.—Coal from Ngakauau. 101

- 10 Reid, Alexander W., Canterbury.—Coal from Kowai Pass. 101
- 11 Oakden, J. J., Canterbury.—Anthracite coal from Lake Coleridge. 101
- 12 Zaranalli Committee.—Lignite from Urenui. 101
- 13 Rowley, Wilson, & Co., Otago.—Coal from Shag Point, Palmerston. 101
- 14 Ross, A., Poverty Bay, Auckland.—Petroleum. 101
- 15 Wilson, W., Christchurch.—Hewn white and yellow limestone. 102
- 16 Zaranaki Committee.—Potters' clay from Urenui. 104
- 17 National Museum, Washington, J. Henry, Secretary.
 - a Skeletons of the moa (dinornis and palapteryk). 100
 - b Model of egg of the dinornis. 100

Metallurgical Products.

- 18 New Zealand Commissioners.—Specimens of alluvial gold and gold-bearing quartz from Auckland, Westland, and Otago, collected by the Bank of New Zealand. 110
- 19 Government of New Zealand.—Specimens of alluvial gold from Nelson and Westland. 110
- 20 Nelson Committee.—Specimens of auriferous quartz from Reefton. 110
- 21 Government of New Zealand.—Specimens of auriferous quartz from the west coast. 110
- 22 Reefton Committee.—Specimens of auriferous quartz from the Inangahua and Lyell districts, Nelson. 110
- 23 Government of New Zealand.—Specimens of alluvial gold from Otago; bars of melted and refined gold; bars of chloride of silver, and silver; model of gold weighing 375 oz., as exported by Bank of New Zealand, Auckland. 110
- 24 Tolhurst, George E., Bank of New Zealand, Wellington.—Models of gold ingots. 110

CANADA.—STATISTICAL PREFACE.

THE Dominion of Canada consists of the provinces of Ontario, Quebec—formerly Upper and Lower Canada—Nova Scotia, New Brunswick, Manitoba, British Columbia, and Prince Edward's Island. The two principal provinces, Quebec and Ontario, are almost entirely embraced within the basin of the river St. Lawrence, but occupy only those portions north of the great lakes, and of the river as far as the town of Cornwall (45° north latitude and $74^{\circ} 45'$ west longitude), whence eastward they occupy both banks, and are bounded on the south by the United States. The most westerly limit is the heads of the Pigeon and Arrow rivers, which debouch in Lake Superior. The eastern or maritime provinces embrace no portion of the basin of the great river.

The following table shows the area and population of the various provinces :

	AREA, ENG. SQ. MILES.	POPULATION (1871).
Ontario,	121,260	1,620,851
Quebec,	210,020	1,191,516
Nova Scotia,	18,660	387,800
New Brunswick,	27,105	285,594
Manitoba,	2,891,734	11,953
British Columbia,	213,000	10,586
Prince Edward's Island,	2,173	94,021
Total,	3,483,952	3,602,321

The principal river of Canada is the St. Lawrence. Its most important tributaries are all from the left. The St. Lawrence drains an area of 565,000 miles. The Ottawa, 450 miles long, forms the boundary between Ontario and Quebec. The St. Maurice is nearly 400 miles in length, and the Saguenay, noted for its fine scenery, is 225 miles long. The only affluents from the right worth naming are the Richelieu, the St. Francis, and the Chaudiere.

A great part of Canada, more especially the shores of Lake Superior, is valuable only for mineral resources, such as iron, zinc, lead, copper, silver, gold, cobalt, manganese, gypsum, marl, granite, sandstone, limestone, slate, and marbles of nearly every imaginable color. Considerable portions, also, though heavily timbered, chiefly with pine, are yet but little adapted to settlement and cultivation. Towards the Gulf of the St. Lawrence, again, a considerable section derives importance mainly from the fisheries, being, with partial exceptions in Gaspé, comparatively worthless for every other object. Thus the area for the profitable production of ordinary cereals cannot materially exceed 40,000 square miles, containing, however, within this space a singularly small portion of irreclaimable surface. This cultivable block increases regularly in width and fertility, from its commencement on the lower St. Lawrence to the shores of Lake Huron. Below Quebec—to say nothing of the precarious nature of the crops—there may always be seen, on one or on both sides, the primeval forest. Between that city, again, and the basin of the Ottawa, a gradual improvement shows itself, even on the north side; and towards the south there stretches away to the frontier of the United States a broad belt of generally undulating character, probably the best field in the country for the blending of pasturage and agriculture. From the basin of the Ottawa inclusive, the parallel of the south end of Lake Nipissing may be said to cut off, towards the southwest, the entire residue of the practicable soil, in the shape of a roughly defined triangle, which, as a whole, is at least equal, in the growth of grain in general and of wheat in particular, to any region of the same extent in North America.

The climate of Canada is subject to great extremes of heat and cold, the thermometer ranging between 102° above and 36° below the zero of Fahrenheit.

As Canada slants southwards eight or nine degrees from the mouth of the St. Lawrence to that of the Detroit, which communicates between Lakes St. Clair and Erie,

the climate of the west must be warmer than that of the east. Besides, the lakes of Upper Canada appear, in a good measure, to neutralize and mitigate the extremes of a Canadian climate. While Quebec in winter ordinarily enjoys five or six months of sleighing, the corresponding season in Toronto ranges from five or six days to five or six weeks. As to summers, the difference in favor of Toronto is rather in point of duration than of intensity. As indications of the climate of Canada, it may be stated that the isle of Orleans, immediately below Quebec, is famous for its plums, and the island of Montreal for its apples; and from the neighborhood of Toronto to the head of Lake Erie, grapes and peaches ripen without any aid whatever. Melons, again, of large size, come to maturity, through the settled parts of the province, in the open air; and pumpkins and squashes attain enormous size, some of them near Toronto having weighed 300 pounds.

The following statistics of the mining, agricultural, and manufacturing industries are taken from the Official Report of the Canadian Census of 1871. They refer only to the provinces of Ontario, Quebec, New Brunswick, and Nova Scotia.

RAW MINERAL PRODUCTS.

Coal,	671,008 tons.	Gold,	22,941 oz.
Iron ore,	129,363 "	Silver,	69,197 "
Copper ore,	13,310 "	Phosphate of lime, . .	1,980 tons.
Pyrites,	2,800 "	Mica,	4,010 lbs.
Manganese,	635 "	Crude petroleum, . .	12,969,435 galls.
Other ores,	14,063 "	Grained marble, . . .	8,870 cub. ft.
Peat,	14,772 "	Building stone for dress-	
Plumbago,	270 "	ing,	5,206,796 "
Lump gypsum,	114,433 "	Roofing slate,	6,013 sqs.

The statistics of agriculture are as follows:

Spring wheat,	10,355,912 bushels.	Beans,	220,644 bushels.
Winter wheat,	6,367,961 "	Buckwheat,	3,726,484 "
Barley,	11,496,068 "	Corn,	3,802,830 "
Oats,	42,489,463 "	Potatoes,	47,330,187 "
Rye,	1,064,354 "	Turnips,	24,339,476 "
Peas,	9,905,720 "	Grass and clover	
Hay,	3,818,641 tons.	seed,	348,605 "

The principal items of furs are 488,182 muskrats, 49,799 minks, 48,151 beavers, 19,271 moose, cariboo and deer, 17,582 martens, 37,402 seals, 12,861 foxes, 6132 otters, and 2553 bears.

The following are the statistics of manufactures:

Capital invested,	\$77,964,020
Number of hands employed,	187,942
Amount of yearly wages,	40,851,009
Value of raw material,	124,907,846
Total value of products,	221,617,773

The statistics of the fisheries are as follows: Vessels, 991, men, 6984; boats, 16,876, men, 25,876; shoremen, 4647; fathoms of nets, 1,879,435.

The leading items of the product of the fisheries were 682,631 quintals of cod, 120,213 quintals of haddock, 417,300 barrels of herring, 77,925 barrels of mackerel, 2491 gallons of cod-liver oil, and 676,403 gallons of other fish oils.

The foreign trade, during 1874, was, including bullion and specie, as follows: Imports, \$128,213,582; exports, \$89,851,928. The trade of the Dominion of Canada is chiefly with the United States and Great Britain.

The "British North American Act, 1867," orders that the constitution of the Dominion shall be "similar in principle to that of the United Kingdom;" that the executive authority shall be vested in the sovereign of Great Britain and Ireland, and carried on in her name by a Governor-general and Privy Council; and that the legislative power shall be exercised by a Parliament of two Houses, called the Senate and the House of Commons. Provision is made in the act for the admission of Newfoundland, still an independent province of British North America, into the Dominion of Canada. The seven provinces forming the Dominion have each a separate parliament and administration, with a Lieutenant-governor at the head of

the executive. They have full power to regulate their own local affairs, dispose of their revenues, and enact such laws as they may deem best for their own internal welfare, provided only they do not interfere with, and are not adverse to, the action and policy of the central administration under the Governor-general.

The public debt of the Dominion, incurred chiefly on account of public works, and the interest on which forms the largest branch of the expenditure, was \$116,082,917 on the 1st of July, 1875. The total revenue during the year ending June 30th, 1874, was \$39,930,791; the total expenditure during the same period, \$36,524,876.

The strength of the troops maintained by the imperial government, and forming the garrison of Halifax, was reduced, in 1871, to 2000 men. Besides these, Canada has a large volunteer force, and a newly organized militia. By the terms of the act passed in March, 1868, "to provide for the defence of the Dominion," the militia consists of all British subjects between the ages of 18 and 60, who are called out to serve in four classes, namely: 1st class, 18 to 30, unmarried; 2d, from 30 to 45 unmarried; 3d, 18 to 45, married; 4th, 45 to 60. A general order from the Militia Department, issued in 1874, reduced the active militia force, for the purposes of drill and pay, for the years 1874 and 1875, to 30,000 officers and men. Two schools of military instruction for infantry are established in each of the provinces of Ontario and Quebec, and one in each of the provinces of New Brunswick and Nova Scotia.

The naval forces of Canada consisted, in 1875, of 8 screw steamers, carrying 18 guns. Besides these, the government owned two fast steamers, employed on coast service, not fitted with guns, but available as gunboats.

The total shipping registered on the 31st of December, 1874, was 6930 vessels of a burthen of 1,158,363 tons. Included in this were 634 steamers, of 76,487 tons.

At the end of October, 1874, Canada had a network of railways of a total length of 4022 miles. There were, at the same period, lines of a total length of 1120 miles in course of construction, and 3000 miles more had been surveyed and concessions granted by the government.

On June 30th, 1875, there were in the Dominion, 3943 post offices. The number of letters and post-cards sent through the mails, during the year, was 34,750,000; of newspapers, 25,480,000.

The provinces of Quebec and Ontario have separate school laws, adapted to the religious element prevailing in either. Each township in Ontario is divided into several school sections, according to the requirements of inhabitants. The common schools are supported partly by the government and partly by local self-imposed taxation, and occasionally by the payment of a small fee for each scholar. All teachers must pass an examination before a county board of educators, or receive a license from the provincial normal school, empowering them to teach, before they can claim the government allowance.

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CANADA.

(North of Nave, Columns 16. to 23.)

Minerals.

Minerals, Ores, Stone, Mining Products.

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| <p>1 Gatling Gold Mining Co., Marmora, Ont.—Gold-bearing arsenical pyrites. 100</p> <p>2 Russell, W. W., Ottawa, Ont.—Gold in quartz. 100</p> <p>3 Lindsay, J. A., Toronto, Ont.—Gold, silver, and magnetic ores. 100</p> <p>4 Jackfish Lake Gold Mining Co., Toronto, Ont.—Gold and silver in quartz. 100</p> <p>5 McKellar Bros., Prince Arthur's Landing, Ont.—Gold in quartz. 100</p> <p>6 McKellar, D., Prince Arthur's Landing, Ont.—Gold in quartz. 100</p> <p>7 Toronto Gold Mining Co., Toronto, Ont.—Gold-bearing arsenical pyrites. 100</p> <p>8 Lockwood, W. P., St. Francois, Q.—Gold. 100</p> <p>9 Geological Survey, Canada, Q.</p> <p style="padding-left: 20px;">a Quartz, magnetic sand, and alluvial gold, models of gold nuggets, platinum, copper pyrites, native copper, magnetite, magnetic iron sand, hematite, iron ores, iron pyrites, native iron, antimony ore, galena, blende, barytes, mica, magnesite, kermesite, celestine, albite, orthoclase, asbestos, amethyst, agates, and Canadian rocks. 100</p> <p style="padding-left: 20px;">b Coal from Saskatchewan river, bituminous shale, crude and inspissated petroleum. 101</p> <p style="padding-left: 20px;">c Sandstones, marbles, marble column, dolomite, limestone, syenite, granite, gneiss, labradorite, jasper conglomerate, ornamental and polished slate, cut and polished stones. 102</p> <p style="padding-left: 20px;">d Hydraulic cement, gypsum. 103</p> <p style="padding-left: 20px;">e Clay, fire clay, clay for moulding, river and moulding sand, soapstone. 104</p> <p style="padding-left: 20px;">f Graphite. 105</p> <p style="padding-left: 20px;">g Lithographic stones, grindstones, whetstones, buhr stones, granite for millstones. 106</p> <p style="padding-left: 20px;">h Brine, mineral water, phosphate of lime, shell marl. 107</p> <p>10 Oppenheimer Bros., Victoria, Br. Col.—Gold nugget. 100</p> <p>11 Robertson, Robt., Halifax, N. S.—Representation of the gold fields of Nova Scotia. 100</p> <p>12 Donaldson, T. B., Oldham, N. S.—Gold in quartz. 100</p> <p>13 Sibley, A. H., Silver Islet, Ont.—Silver ores and native silver. 100</p> <p>14 McKellar Bros., Fort William, Ont.—Silver ores, native silver, copper pyrites, and barytes. 100</p> <p>15 Marks, T., & McKellar Bros., Fort William, Ont.—Silver ores. 100</p> | <p>16 Dawson, S. J., Ottawa, Ont.—Silver ores. 100</p> <p>17 Cyrette, Ambrose, Fort William, Ont.—Silver ores. 100</p> <p>18 Van Norman, Judge, Prince Arthur's Landing, Ont.—Native silver and silver ores. 100</p> <p>19 Plumber, McIntyre, & Russ, Fort William, Ont.—Silver ores. 100</p> <p>20 Eames, Prof., Pie Island, Ont.—Silver veinstone. 100</p> <p>21 Stephen, George, Montreal, Q.—Silver ores. 100</p> <p>22 Eureka Mining Co., Victoria, Br. Col.—Silver ores. 100</p> <p>23 Mechanics' Institute, N. Westminster, Br. Col.</p> <p style="padding-left: 20px;">a Platinum. 100</p> <p style="padding-left: 20px;">b Anthracite. 101</p> <p>24 West Canada Mining Co., Welling-ton, Ont.—Copper pyrites, copper ore. 100</p> <p>25 Hime, H. L., Toronto, Ont.—Copper pyrites. 100</p> <p>26 Plumber, B., Bruce Mine, Ont.—Copper pyrites. 100</p> <p>27 Oliver, Geo., Perth, Ont.—Copper pyrites, bog iron ore. 100</p> <p>28 Ontario Advisory Board, Toronto, Ont.</p> <p style="padding-left: 20px;">a Copper pyrites, magnetic hematite, galena. 100</p> <p style="padding-left: 20px;">b Serpentine, syenite. 102</p> <p style="padding-left: 20px;">c Graphite. 105</p> <p style="padding-left: 20px;">d Emery. 106</p> <p style="padding-left: 20px;">e Phosphate of lime, shell marl. 107</p> <p>29 Shaw, P., Harvey Hill, Q.—Copper pyrites. 100</p> <p>30 Stewart, W. W., Montreal, Q.—Native copper. 100</p> <p>31 Douglas, Dr., Quebec, Q.—Copper ore. 100</p> <p>32 Davidson, Wm., Alma, N. B.—Copper glance. 100</p> <p>33 Russell, Grand Manan, N. B.—Copper glance. 100</p> <p>34 Cole, Rufus, Dorchester, N. B.—Copper glance. 100</p> <p>35 Sweet, R. J., Halifax, N. S.—Copper glance. 100</p> <p>36 Lloyd, H. C., Madoc, Ont.—Magnetite, hematite. 100</p> <p>37 Ledyard, T. D., Toronto, Ont.—Magnetite. 100</p> <p>38 Haycock, Will., Templeton, Q.—Magnetite. 100</p> |
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Minerals, Coal, Oil.

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| 39 Cobourg & Petersboro' Iron Co., Belmont, Ont.—Magnetite. 100 | 75 Blackwood, R., Toronto, Ont.—Amethyst, fluorspar, and pyrites. 100 |
| 40 Bishop, A., Bell's Corners, Ont.—Magnetite. 100 | 76 Morrison, W. A., Toronto, Ont.—Collection of Canadian precious stones. 100 |
| 41 Foley, James, Bathurst, Ont.—Magnetite with apatite. 100 | 77 Poole, H. S., Halifax, N. S.—Ores and associated rocks. 100 |
| 42 Baldwin, A. H., Hull, Q.—Magnetite. 100 | 78 Honeyman, Dr., Halifax, N. S.—Collection of Nova Scotia fossils. 100 |
| 43 Chipman, David, Berwick, N. S.—Magnetite. 100 | 79 How, Henry, Windsor, N. S.—Collection of minerals. 100 |
| 44 Lewis, Queen Charlotte's Island, Br. Col.—Magnetite. 100 | 80 Bailey, G., Grand Lake, N. B.—Coal. 101 |
| 45 Cowan, A., Brockville, Ont.
a Hematite, burnt iron pyrites. 100
b Phosphate and superphosphate of lime. 107 | 81 Hall, William, Springhill, N. S.—Coal. 101 |
| 46 Crawford, J. D., & Co., Montreal, Q.—Hematite, spathic iron ore. 100 | 82 Mitchell, Henry L., Glace Bay Mines, N. S.—Coal. 101 |
| 47 Ganthier, O., St. Urbain, Q.—Titanic iron ore. 100 | 83 McQueen, Wm., Blockhouse Mines, N. S.—Coal. 101 |
| 48 Matheson & Gilice, Sydney, N. S.—Hematite. 100 | 84 Brown, R. H., Sydney Mines, N. S.—Coal. 101 |
| 49 Ross, N. S.—Hematite. 100 | 85 McDonald, R. A., International Mines, N. S.—Coal. 101 |
| 50 Webster, N. S.—Hematite. 100 | 86 McKeen, David, Caledonia Mines, N. S.—Coal. 101 |
| 51 Blanchard, N. S.—Hematite. 100 | 87 Archibald, T. D., Gowrie Mines, N. S.—Coal. 101 |
| 52 Ottawa Iron and Steel Co., Ottawa, Ont.—Iron ore. 100 | 88 Sutherland, James, Big Glace Bay, N. S.—Coal. 101 |
| 53 Stobie, James, Sault St. Marie, Ont.—Iron ore. 100 | 89 Fraser, J. W., Victoria Mines, N. S.—Coal. 101 |
| 54 Duval, H. H., Quebec, Q.—Titanic iron ore. 100 | 90 Routledge, William, Gardiner Mines, N. S.—Coal. 101 |
| 55 McDougall, John, Three Rivers, Q.—Bog iron ore. 100 | 91 Campbell, C. J., N. Campbellton, N. S.—Coal. 101 |
| 56 Steel Co. of Canada, Londonderry, N. S.—Iron ores. 100 | 92 Hoyt, Jesse, Acadia Mines, N. S.—Coal. 101 |
| 57 MacKinnon, J. C., Whycocomagh, N. S.—Iron ores. 100 | 93 Hudson, James, Albion Mines, N. S.—Coal. 101 |
| 58 Duhamel, Dr., Quebec, Q.—Iron pyrites. 100 | 94 Simpson, James, Intercolonial Mines, N. S.—Coal. 101 |
| 59 Russell, Willis, Lotbiniere, Q.—Antimony ore. 100 | 95 Greener, John, Vale Calling, N. S.—Coal. 101 |
| 60 Hibbard, F., Prince William, N. B.—Antimony ore. 100 | 96 Bennett, Wm., Scotia Mines, N. S.—Coal. 101 |
| 61 Hime, L. H., Toronto, Ont.—Galena and copper pyrites with silver and gold. 100 | 97 Sterling, E., Cape Breton, Big Glace Bay, Sydney, and L. Mines, N. S.—Coal. 101 |
| 62 Sibley, Col., & J. McIntyre, Silver Islet, Ont.—Galena. 100 | 98 Union Mining Co., Union Mines, Comox, Br. Col.—Coal. 101 |
| 63 Johnson, C. J., Wallaceburg, Ont.—Galena, blende. 100 | 99 Baynes Sound Mining Co., Baynes Sound Mines, Br. Col.—Coal. 101 |
| 64 Devine, Thos., Toronto, Ont.—Galena. 100 | 100 Vancouver Mining Co., Vancouver Mines, Br. Col.—Coal. 101 |
| 65 Wearne, Capt., Toronto, Ont.—Galena, blende. 100 | 101 Wellington Mining Co., Wellington Mines, Br. Col.—Coal. 101 |
| 66 Markham, A., Hammond, N. B.—Pyrolusite. 100 | 102 Ketchum, E. K., Albert Mines, N. B.—Albertite and bituminous shale. 101 |
| 67 Brown, J., N. S.—Pyrolusite. 100 | 103 Byers, J., Albert Mines, N. B.—Albertite. 101 |
| 68 Galway Lead Mining Co., Galway, Ont.—Barytes, calcspar. 100 | 104 Smith, Wm., Toronto, Ont.—Peat. 101 |
| 69 Dolphin Manufacturing Co., Five Islands, N. S.—Barytes. 100 | 105 Grand Trunk R. R., Montreal, Q.—Peat. 101 |
| 70 Starr, John, Halifax, N. S.—Barytes. 100 | 106 Griffin, R. A., Huntingdon, Q.—Peat. 101 |
| 71 Baker Mine, North Burgess, Ont.—Mica in plates. 100 | 107 Belliveau Albertite & Oil Co., Westmoreland, N. B.—Albertite mineral oil. 101 |
| 72 Ackerly, James, Five Islands, N. S.—Dogtooth spar. 100 | 108 Waterman Bros., London, Ont.—Petroleum and products. 101 |
| 73 Dopp, Geo., Berlin, Ont.—Amethyst, fluorspar, and pyrites. 100 | |
| 74 McVicar, Geo., Toronto, Ont.—Amethyst. 100 | |

Stone.

- | | |
|--|---|
| 109 Gibson, Robert L., Grimsby, Ont.
—Building sandstones. 102 | 141 Barclay & Morrison, Stony Mount,
Man. 102 |
| 110 Farquhar & Booth, Esquesing, Ont.
—Building sandstones and flagging. 102 | a Dolomite. 102 |
| 111 Skead, Gloucester, Ont.—Building
sandstones. 102 | b Clay. 104 |
| 112 Londley, Beckwith, Ont.—Building
sandstones. 102 | 142 Hayslip, John, Goderich, Ont.—
Limestone. 102 |
| 113 Rankin, John, Pembroke, Ont.—
Building sandstones. 102 | 143 Young, Y., & G., Gloucester, Ont.—
Limestone. 102 |
| 114 Bishop, Henry, Nepean, Ont.—
Building sandstones. 102 | 144 Levallée, N., Carleton Place, Ont.—
Limestone. 102 |
| 115 Decew, William, Oneida, Ont.—
Building sandstones. 102 | 145 Kirkpatrick Quarry, Parrsboro',
Q.—Limestone. 102 |
| 116 McGregor, Lachute, Q.—Building
sandstones and limestones. 102 | 146 Forsyth, Robert, Montreal, Q.—
Red granite monument. 102 |
| 117 Goodfellow, Joseph, North Esk, N.
B. 102 | 147 Bay of Fundy Red Granite Co.,
St. George, N. B.—Red polished gran-
ite. 102 |
| a Building sandstones. 102 | 148 Danville School Slate Co., Dan-
ville, Q.—Ornamental slate panel, slates
in blocks. 102 |
| b Grindstones. 106 | 149 Danville Slate Co., Danville, Q.—
School slates. 102 |
| 118 Dor. U. Free Stone Co., Budreau,
Vil., N. B.—Building sandstones. 102 | 150 Rockland Slate Quarry, Melbourne,
Q.—Slates. 102 |
| 119 Caledonia Free Stone Co., Rock-
land, N. B.—Building sandstones. 102 | 151 DeCew, William, Cayuga, Ont.
a Lime and limestone. 103 |
| 120 Roberts & Co., Mary's Point, N.
B.—Building sandstones. 102 | b Sandstone for glass-making and furnace
lining. 104 |
| 121 Bayview Quarry Co., Albert City,
N. B.—Building sandstones. 102 | 152 Whitson & Slater, St. Marys, Ont.
—Lime and limestone. 103 |
| 122 Hopewell Quarry Co., Shepody
Mt., N. B.—Building sandstones. 102 | 153 Dunbar, George, Rockwood, Ont.—
Lime and limestone. 103 |
| 123 McQuarrie, John, George River, N.
S.—Building sandstones. 102 | 154 Lewis, Lévi, Kincardine, Ont.—
Lime and limestone. 103 |
| 124 Gilpin, Edwin, Springville N. S.
a Building sandstones. 102 | 155 Buxton, George, Goderich, Ont.—
Lime and limestone. 103 |
| b Limestone. 103 | 156 Emsley, R., Guelph, Ont.—Lime
and limestone. 103 |
| c Fire brick and fire clay. 104 | 157 Ballantyne, Mrs., Galt, Ont.—Lime
and limestone. 103 |
| 125 Heustis, R. B., Wallace, N. S.—
Building sandstones. 102 | 158 Farquhar, E., & C., Dundas, Ont.—
Lime and limestone. 103 |
| 126 McDonald, George J., Cornwallis,
N. S.—Building sandstones. 102 | 159 Goudle, Thomas, Limehouse, Ont.
—Lime and limestone. 103 |
| 127 Peters, Henry S., Halifax, N. S.—
Building sandstones. 102 | 160 Lavallée, N., Carleton Place, Ont.
—Lime and limestone. 103 |
| 128 Vancouver Coal Co., Vancouver
Island, Br. Col.—Building sandstones,
marble, limestone. 102 | 161 Baker, W., Arnprior, Ont.—Lime
and limestone. 103 |
| 129 Howley, James, Montreal, Q.
a Building and flagging sandstones. 102 | 162 Quebec Advisory Board, Quebec,
Q. 103 |
| b Sandstone for glass-making. 104 | a Lime and limestone. 103 |
| 130 Pitton & Co., Quebec, Q.—Sand-
stone, flagging, curbstones. 102 | b Porcelain clay. 104 |
| 131 Worthington & Co., Montreal, Q.
a Polished marble. 102 | c Phosphate of lime, chalk. 107 |
| b Limestone. 103 | 163 Garvies, C. A., Montreal, Q.—Lime
and limestone. 103 |
| 132 Somerville, P. T., Arnprior, Ont.—
Marble monument. 102 | 164 Robitaille, Dr., Quebec, Q.
a Limestone. 103 |
| 133 Halon, Alphonse, Quebec, Q.—
Marble. 102 | b Marl. 107 |
| 134 Benjamin, H., & Co., Montreal, Q.
a Marble. 102 | 165 Albert Manufacturing Co., Hills-
boro', N. B.—Limestone. 103 |
| b Lime. 103 | 166 Quesnal, Sheriff, Arthabaska, Q.—
Lime and hydraulic cement. 103 |
| 135 Brunet, Joseph, Montreal, Q.—
Marble monument. 102 | 167 Douglas, David, Pugwash, N. S.
—Lime. 103 |
| 136 Langevin, A. B., Quebec, Q.—Mar-
ble. 102 | 168 Goudie, Thomas, Limehouse, Ont.
—Hydraulic cement. 103 |
| 137 Silver, John, Halifax, N. S.—Mar-
ble. 102 | 169 McKay, Wm., Ottawa, Ont.—Hy-
draulic cement and artificial stone. 103 |
| 138 McQuarrie, John, George River,
N. S.—Marble and syenite. 102 | 170 Buchanan Mineral Co., Hamilton,
Ont.—Cement and mastics. 103 |
| 139 Ingram, Wm., St. George, N. B.—
Red granite clock case. 102 | 171 Gauvreau, P., & Co., Quebec, Q.—
Cements and plasters, artificial stone. 103 |
| 140 Baxter B., Cayuga, Ont.
a Dolomite. 102 | |
| b Lime and limestone, hydraulic cement. 103 | |

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GEO. A. PELTZ, Associate Editor

JOHN WANAMAKER, Publisher.

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PHILADELPHIA.

Stone, Mineral Water.

- 172 Hill, Albert J., Sydney, N. S.—Selenite. 103
- 173 Gregory, V. R., & Co., Toronto, Ont.—Artificial stone monument. 103
- 174 Wandly, Henry, Clover Hill, Toronto, Ont.—Artificial stone. 103
- 175 Milner & Herd, Strathroy, Ont.—Artificial stone window cap. 103
- 176 Jocelyn, H. L., Tilsonbourg, Ont.—Marble roofing. 103
- 177 Riggins, George, Kincardine, Ont.—Clay for bricks. 104
- 178 Russell, Samuel, London, Ont.—Clay for bricks. 104
- 179 Munn & Cochner, Dundas, Ont.—Clay for bricks. 104
- 180 Leslie, Robert, Glenwilliam, Ont.—Clay for bricks. 104
- 181 Townshend, Mrs. Mary, Rockville, Ont.—Clay for bricks. 104
- 182 Anderson, Thos., Nepean, Ont.—Clay for bricks. 104
- 183 Cashmore, Thos., Pembroke, Ont.—Clay for bricks. 104
- 184 McGregor, Daniel, Pembroke, Ont.—Clay for bricks. 104
- 185 Baker, William, Arnprior, Ont.—Clay for bricks. 104
- 186 Foshick, Eneas, Ramsay, Ont.—Clay for bricks. 104
- 187 Moore, Gilbert, Ramsay, Ont.—Clay. 104
- 188 Coulter, James, Ramsay, Ont.—Clay. 104
- 189 Metcalfe, James, Ramsay, Ont.—Clay. 104
- 190 Foster, W. A., Belleville, Ont.—Clay. 104
- 191 Workman, Hugh, Brantford, Ont.—Clay. 104
- 192 Peel, Thos. W., Montreal, Q.—Clay. 104
- 193 Mochan, Albert, St. Johns, Q.—Clay. 104
- 194 Jackson, Charles, Woodstock, N. B.—Clay. 104
- 195 Wells, William, Beamsville, Ont.—Pottery clay. 104
- 196 Ahren, J. H., Paris, Ont.—Pottery clay. 104
- 197 Pratt, Charles, London, Ont.—Pottery clay. 104
- 198 Farrar, G. H., & L. E., St. Johns, Q.—Pottery clay. 104
- 199 Bell, David, St. Johns, Q.—Clay drain tile. 104
- 200 Copeland & McLaren, Montreal, Q.—Fire clay, sandstone facing for furnaces. 104
- 201 McMann, G. N., Grand Lake, N. B.—Fire clay. 104
- 202 Bannerman, Robert, Montreal, Q.—Pipe clay. 104
- 203 St. Johns Stone Chinaware Co., St. Johns, Q.—Fire brick. 104
- 204 Bishop, H., Nepean, Ont.—Sandstone for glass-making. 104
- 205 McDougall, John, & Sons, Three Rivers, Q.—Sandstone for furnace lining. 104
- 206 Gil Cloth Factory, Yorkville, Ont.—Sand. 104
- 207 Jackson, Charles, Woodstock, N. B.—Brick sand. 104
- 208 Sweet, S. H., Wentworth, N. S.
a Kaolin. 104
b Gypsum. 107
- 209 McDonald, George J., Cornwallis, N. S.—Refractory stone. 104
- 210 Law, John, London, Ont.—Black lead crucible. 105
- 211 Dominion of Canada Plumbago Co., Ottawa, Ont.—Graphite crucible, pencil, stove polish, etc. 105
- 212 Millet, John G., Grenville, Q.—Graphite. 105
- 213 Montreal Plumbago Mining Co., Montreal, Q.—Stove polish and crucibles. 105
- 214 Martin, Charles, Montreal, Q.—Stove polish. 105
- 215 Kelly, John, Belleville, Ont.—Lithographic stones. 106
- 216 Ontario Lithographic Stone Co., Marmora, Ont.—Lithographic stone. 106
- 217 Read, Stevenson, & Co., Dorchester, N. B.—Grindstone polishing and cutters' stone. 106
- 218 Seaman & Co., Lower Cove, N. S.—Grindstones. 106
- 219 Douglass, David, Port Philip, N. S.—Grindstones. 106
- 220 Leroux, G., Quebec, Q.—Millstones. 106
- 221 Casgrain, Stoneham, Q.—Tripoli. 106
- 222 Fisher, W., Victoria, Br. Col.—Tripoli. 106
- 223 Coleman, William, Paris, Ont.—Raw and prepared gypsum. 107
- 224 Ontario Plaster Co., Mt. Healy, Ont.—Raw and prepared gypsum. 107
- 225 Converse, John A., Montreal, Q.—Raw and prepared gypsum. 107
- 226 Brown, A., Petitcodiac, N. B.—Gypsum and selenite. 107
- 227 Tobique Gypsum Co., Tobique, N. B.—Gypsum. 107
- 228 Albert Manufacturing Co., Hillsboro, N. B.—Calcined and anhydrous gypsum; alabaster. 107
- 229 McDonald, R. N., International M., N. S.—Gypsum. 107
- 230 Nova Scotia Advisory Board, Halifax, N. S.—Gypsum. 107
- 231 Davidson, H. A., Black River, N. S.—Gypsum. 107
- 232 Cove, Jas. A., Claremont Hill, N. S.—Gypsum. 107
- 233 Fulton, C. A., Wallace, N. S.—Gypsum. 107
- 234 McLennan, Jos., Montague, N. S.—Gypsum. 107
- 235 Merchants' Salt Co., Seaforth, Ont.—Brine. 107
- 236 International Works, Goderich, Ont.—Brine. 107
- 237 Ransford, H., Clinton, Ont.—Brine. 107
- 238 Tecumseh Works, Goderich, Ont.—Brine. 107

Mineral Water, Metallurgical Products.

- 239 Gray, Young, & Spalding, Seaforth, Ont.—Brine. 107
- 240 Jourvie, J. A., & Co., Caledonia Springs, Ont.—Saline, gas, and sulphur waters. 107
- 241 Winning, Hill, & Ware, Montreal, Q.—Carratraca water. 107
- 242 Gee, J. N., St. Francis Spring, Q.—Mineral water. 107
- 243 Hickman, James S., Amherst, N. S.—Saline water. 107
- 244 Murray, Edmund W., Buckingham, Q.—Phosphate of lime. 107
- 245 Buckingham Mining Co., Buckingham, Q.—Crystal phosphate of lime. 107

Metallurgical Products.

- 246 Silver Islet Co., Silver Islet, Ont.—Ingot of silver. 110
- 247 Ottawa Iron & Steel Manufacturing Co., Ottawa, Ont.—Iron billets, manufactured iron. 111
- 248 Aydon Patent Smelting Co., Mor-mora, Ont.—Pig iron, smelted with pure petroleum. 111

- 249 Gauthier, O., St. Urbain, Q.—Titanic pig iron. 111
- 250 McDougall, John, & Sons, Three Rivers, Q.—Charcoal iron, iron bars, bent and twisted cold, axes, tomahawk, slag. 111
- 251 Canadian Titanic Co., Baie St. Paul, Q.—Slags, titanic iron. 111
- 252 Chinic Eugene, Quebec, Q.—Viger steel. 111
- 253 Moisis Iron Works, Montreal, Q.—Iron, iron bloom. 111
- 254 McDougall, John, Montreal, Q.—Iron bloom, car-wheels. 111
- 255 Haycock, Edw., Templeton, Q.—Forged iron bloom. 111
- 256 Coldbrook Rolling Mills, St. Johns, N. B.—Iron bars, rolled plates, car-wheels. 111
- 257 Harris, Jas., & Co., St. Johns, N. B.—Rolled iron plate. 111
- 258 Steel Co. of Canada, Londonderry, N. S.—Iron and steel. 111
- 259 West Canada Mining Co., Bruce Mines, Ont.—Ingot copper. 112
- 260 Lake George Antimony Co., Prince William, N. B.—Babbit metals, regulus, slags, oxidized ore. 113

FRANCE.—STATISTICAL PREFACE.

FRANCE is the most westerly state of Central Europe, extending from $42^{\circ} 20'$ to $51^{\circ} 5'$ north latitude, and from $7^{\circ} 45'$ east to $4^{\circ} 45'$ west longitude. It is bounded on the north by the Channel and the Straits of Dover, which separate it from England, by Belgium, the grand duchy of Luxembourg; on the east by Germany, Switzerland, and Italy, on the south by the Mediterranean and Spain, from which it is separated by the Pyrenees, and on the west by the Atlantic Ocean (the Bay of Biscay). The greatest length of France, from Dunkirk, in the north, to the Col de Falguere, in the south, is about 620 miles; its greatest breadth from east to west, from the boundary line in the Vosges to Cape St. Matthieu, in Finisterre, is about 550 miles. The superficial area of France, including the two Savoy provinces and Corsica, is reckoned at about 201,600 square miles. The possessions of France, which are situated in the non-European parts of the world, have a total superficial area of 463,827 square miles, and the largest is Algeria, with an area of 258,310 square miles. France is divided into 86 departments. The total population, exclusive of Algeria and the colonies, was given (in 1872) at 36,102,921.

The colonies and foreign possessions of France in Africa are Algeria, Senegambia, the islands of Bourbon (Reunion), St. Marie, Mayotte, and Nossi-be, in the Indian Ocean, and Gaboon, on the coast of Guinea. The total possessions in Africa cover an area of about 270,000 square miles, with a population of 2,840,000 souls. In America are the islands of Martinique and Guadeloupe in the West Indies, French Guiana, or Cayenne, with St. Pierre and Miquelon, near Newfoundland; forming together an area of 45,000 square miles, with a population of 345,000. In Asia, the Indian settlements of Pondicherry, Mahe, Karikal, Yanaon, and Chaudernagore, comprise 19,600 square miles, with a population of 265,000. A settlement has also

been made in Cochin China, embracing 21,700 square miles and 1,336,000 inhabitants, and a protectorate declared over the Empire of Anam. In the Pacific Ocean are two groups, the Marquesas and Tahiti, and New Caledonia, with the Loyalty Isles, the whole forming an area of 11,182 square miles, with 87,000 inhabitants.

The following table gives the population, in 1872, of some of the largest cities in France :

Paris,	1,850,000
Lyons,	323,000
Marseilles,	313,000
Bordeaux,	194,000
Lille,	158,000
Toulouse,	125,000
Nantes,	119,000
St. Etienne,	111,000
Rouen,	102,000

There are four great mountain chains belonging to France—the Pyrenees which separate the French territory from Spain; the Cevenne-Vosgian range, running north and south between the Moselle and the new boundary line; the Alps, which separate the Swiss territory from the provinces of Savoy and Nice; and the Sardo-Corsican range which belongs, as the name implies, to the islands of Sardinia and Corsica. The highest peaks in the Pyrenees are the Maladetta and Mont Perdu (10,886 feet and 10,994 feet); in the Cevenno-Vosgian range, the greatest height (the Widderkalm) does not greatly exceed 7000 feet. The French portion of the Alps now includes several of the highest mountains and most elevated passes of the ranges, as Mont Blanc, 15,744 feet; Mont Iscran, 13,272 feet; Mont Cenis, 11,457 feet; and the pass of Little St. Bernard, 7190 feet, etc. In Corsica, the highest peak rises to an elevation of 9000 feet. The grand water-shed of France is the Cevenno-Vosges chain, which determines the direction of the four great rivers, the Seine, the Loire, the Garonne, and the Rhone; the first three of which flow north-west into the Bay of Biscay and the English Channel, and the fourth into the Gulf of Lyons.

The entire extent of river navigation in France amounts to 5500 miles, or 8,900,000 metres, while the 99 larger canals, which have been constructed either to connect the various river courses or to supply entirely new channels of water communication, extend over a length of 2900 miles, or 4,700,000 metres. The most important of these works are the canals connecting Nantes and Brest, and the Rhone with the Rhine, and those of Berry, Nivernais, and Bourgogne.

France is peculiarly rich in mineral springs, of which there are said to be nearly 1000 in use. Of these, more than 400 are situated in the group of the Pyrenees, where there are 93 establishments for their systematic use. It is estimated that there are, moreover, fully 4000 springs not hitherto employed.

According to M. Maurice Block's estimate, the physical and agricultural character of the soil of France may be comprised under the following heads :

	HECTARES.*
Mountainous districts, heaths, and commons,	9,944,839
Rich land,	7,276,399
Chalk, or lime districts,	9,788,197
Gravel, stony and sandy,	15,951,618
Clay, marshy, miscellaneous,	9,807,577
	<hr/> 52,768,600

* The *hectare* is equal to about 2.47 English acres.

The same writer further subdivides the soil of France, according to its actual employment, under the following heads:

	PER CENT. OF THE WHOLE ACRE.
Arable lands,	48.3
Meadow lands,	9.7
Vineyards,	3.7
Cultivated lands,	17.8
Roads, streets, public walks, etc.,	3.7
Forest and unproductive lands,	16.8

France possesses one of the finest climates in Europe, although, owing to its great extent of area, very considerable diversities of temperature are to be met with. The mean annual temperature of different parts of France has been estimated as follows, by Humboldt: Toulon, 62° F.; Marseilles, 59.5°; Bordeaux, 56°; Nantes, 55.2°; Paris, 51.2°; Dunkirk, 50.5°.

The following are the statistics of agricultural productions for the year 1869:

	HECTOLITRES.*
Wheat,	108,000,000
Rye,	24,000,000
Barley and oats,	90,000,000
Maize,	10,000,000
Potatoes,	100,000,000

The production of beet-root sugar in 1872-73 amounted to 418,000 tons. The average yearly produce of the vineyards of France is estimated at about 50,000,000 of hectolitres (about 1,000,000,000 of gallons). Of this about one-seventh is made into brandy.

The principal forest trees are the chestnut and beech on the central mountains, the oak and cork tree in the Pyrenees, and the fir in the Landes. The destruction of the national forests has been enormous within the last two centuries, but measures have been taken in recent years to plant wood, in order to protect those mountain slopes which are exposed to inundations from mountain torrents, and to provide a supply for the ever-increasing demand for fuel. About one-seventh of the entire territory of France is still covered with wood. Turf taken from the marshy lands is extensively used, more especially in the rural districts, for fuel.

According to the census of 1866—the most recent in regard to animals—there were in France 3,312,637 horses, 518,000 asses, 350,000 mules, 12,733,000 horned cattle, 30,386,000 sheep, 5,500,000 swine, and 1,680,000 goats. There were, according to the *Statistique Agricole* for 1858, about 3,000,000 of beehives, valued at rather more than 24,000,000 of francs; the mean annual returns are, for honey, 6,670,000, and for wax, 1,620,000 kilogrammes.† Poultry constitutes an important item of farm produce in France, estimated at 45,500,000 of francs, while the eggs and feathers yield 35,250,000 of francs.

The following figures show the condition of the merchant navy of France on the 31st of December, 1873:

		TONNAGE.	MEN.
Sailing vessels,	15,043	882,866	83,541
Steam vessels,	516	185,165	10,448
	15,559	1,068,031	98,989

The *cabotage*, or internal coasting traffic, is a great source of financial wealth to the State, to which all rivers and canals belong. In 1873, it employed 2776 vessels, with a tonnage of 122,850 and an equipment of 10,871.

* The *hectolitre* equals 2.75 bushels.

† The *kilogramme* equals 2.2 pounds avoirdupois.

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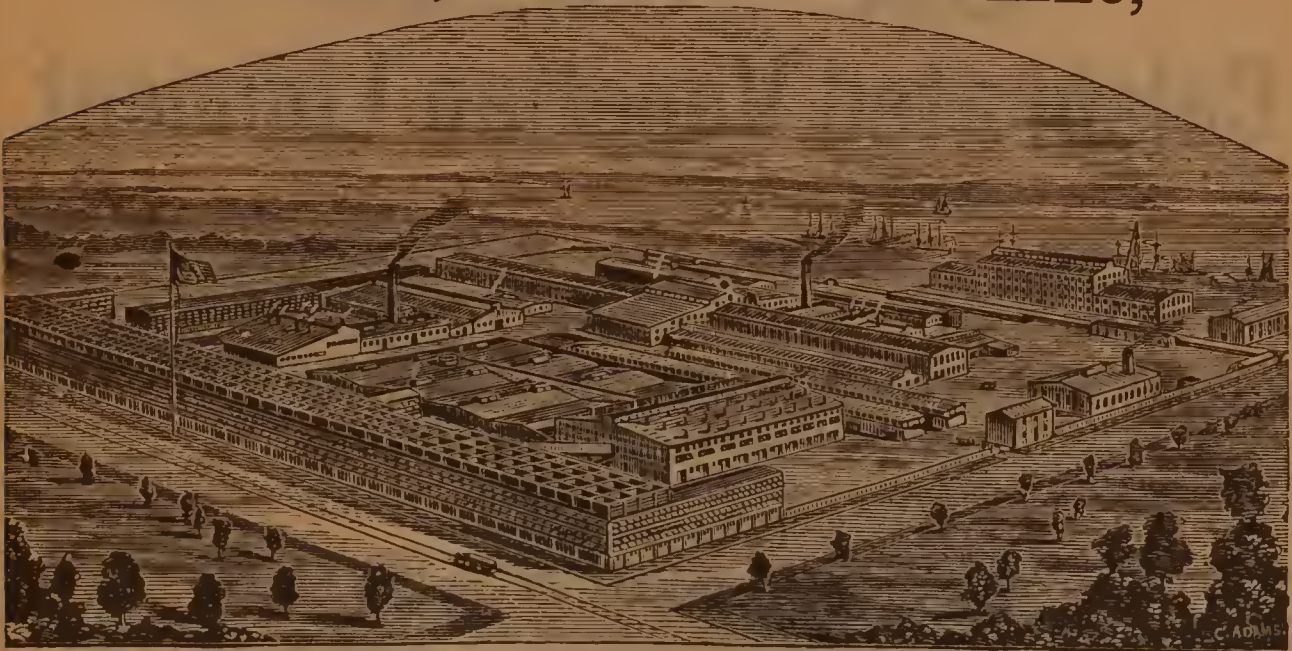
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The chief mineral products of France are coal and iron, in the excavation of which nearly 250,000 men were employed in 1868. The production of coal in 1868 was 132,000,000 of quintals, the quintal being equal to 1.97 hundredweight. During the same year, there were 150 iron mines in operation, yielding 34,500,000 of quintals, more than half of this quantity being obtained from the five departments of Haute-Marne, Haute-Saone, Cher, Moselle, and Nord. Argentiferous galena, a little silver and gold, copper, lead, manganese, antimony, and tin occur, but hitherto their working has not proved very productive. The department of Charente-Inferieure yields the largest amount of salt, the mean annual produce being 1,500,000 of quintals (2,500,000 of francs), which is fully one-third of the entire annual produce of the whole country. France derives about 41,000,000 of francs from its quarries of granite and freestone, its kaolin, marbles, sands, lithographic stones, millstones, etc. Granite and syenite are found in the Alps, Vosges, Corsica, Normandy, and Burgundy; porphyry in the Vosges; and basalt and lava, for pavements, in the mountains of Auvergne. Marble is met with in more than 40 departments; alabaster occurs in the Pyrenes; the largest State quarries are near Cherbourg and St. Lo.

The following list gives an approximate estimate of the value of the chief products of French industry:

	MILLIONS OF FRANCS.
Linen fabrics,	250
Cotton fabrics,	650
Woolen fabrics,	950
Silk fabrics,	1000
Mixed fabrics,	330
Jewelry, watchmaking,	35
Gilt wares,	12
Minerals, mines, salt, etc.,	600
Articles of food, as sugar, wines, etc.,	364
Skins, leather, oils, tobacco,	556
Bone, ivory, isinglass, etc.,	30
Chemical products,	80
Ceramic arts,	86
Paper, printing,	60
Forests, fisheries,	98

The total imports, for 1873, were 4,576,000,000, and the total exports, for the same year, 4,822,000,000 of francs.

France was proclaimed a republic on the 4th of September, 1870. According to the law of February 25th, 1875, the legislative power is vested in the two Houses, the Chamber of Deputies and the Senate. The Chamber of Deputies is elected by universal suffrage. The Senate is composed of 300 members, 225 of whom are elected by the departments and the colonies, and 75 by the National Assembly. The President of the republic is elected by a majority of the votes of the Senate and Chamber of Deputies, united as the National Assembly. His term of office is for seven years, and he is eligible for re-election.

According to the budget for 1876, the estimated receipts for the year are put down at 2,575,028,582 francs, and the expenditures at 2,570,505,513. The public debt is 23,403,000,000 francs.

The nominal strength of the army, on a peace footing, is given in the latest government returns as 490,332 men; on a war footing, 1,750,000.

The navy of France was composed, at the end of 1873, of 62 ironclads, 264 unarmored screw steamers, 62 paddle steamers, and 113 sailing vessels.

According to the official report for December, 1874, the railways in operation measure 20,711 kilometres, or about 12,866 miles. With the exception of less than 500 miles, the railways of France are held by six companies, which are under the superintendence of the State.

The number of letters forwarded by the post office, in 1874, was 341,068,000; newspapers, postal cards, and parcels, 331,786,000.

At the end of 1873, there were 45,942 kilometres of lines of telegraphs, comprising 123,669 kilometres of wire. The number of messages sent, in 1873, was 6,225,000, of which nearly one-fourth were international messages. There were annual deficits since the establishment of the public telegraph department, in March, 1851. There were 2206 telegraph offices at the end of 1873.

Public instruction is presided over in France by a special ministry. Nearly half the expenses connected with it are defrayed by the State, and the remainder by the departments. There are 15 academies, located in the following towns: Aix, Besançon, Bordeaux, Caen, Clermont, Dijon, Douai, Grenoble, Lyon, Montpellier, Nancy, Paris, Poitiers, Rennes, Toulon. These academies are divided into the five faculties of theology, law, medicine, sciences, and literature, and supplemented by various superior and preparatory schools. The professors are paid partly by the State and partly by fees. Secondary instruction has received an immense impetus during the present century. The different departments share very unequally in the diffusion of education, and it may be generally observed that the proportion of the educated is highest in the northern and eastern districts of France. France supports numerous colleges and schools for instruction in special branches of knowledge. There are also numerous agricultural, forest, farming, and veterinary schools, besides the École Polytechnique, specially designed to prepare youths for the public services; and military and naval colleges at St. Cyr, Saumur, Paris, Vincennes, Brest, Toulon, and St. Denis.

Paris possesses several libraries belonging to, and supported by, the State, but freely opened to the public. There are 338 public libraries in the provinces, to all of which access is afforded in the most liberal spirit. France is rich in public galleries of painting, statuary, and articles of *vertu*. The expenses of secondary and primary education, literary and scientific institutions, etc., are charged in the budget for 1876 at 44,912,545 francs.

(Detailed information as to the colonial dependencies of France will be found under the appropriate headings in other portions of the catalogue.)

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The French exhibit in Mining and Metallurgy are deposited in the Agricultural Building and catalogued in Volume III.

GERMANY.—STATISTICAL PREFACE.

THE German Empire occupies the central portion of Europe, and extends from 6° to 22° 40' east longitude and 49° 7' to 55° 50' north latitude. It is bounded on the north by the German Ocean, the Danish Peninsula, and the Baltic; on the east by Russia and Austria; on the south by Russia, Austria, and Switzerland, and on the west by France, Belgium, and the Netherlands. The population (1871) is about 41,000,000. Its area is estimated at 208,000 square miles, or about one-sixteenth of that of all Europe. The coast line measures about 950 miles.

Germany is composed of an aggregation of 26 different States. The following list gives the names of these States, their population, area, and the number of members representing each in the Bundesrath, or Federal Council, and the Reichstag, or Imperial Diet:

STATES.	POPULATION IN 1871.	AREA IN SQUARE MILES.	NO. OF MEMBERS IN BUNDESRATH.	NO. OF DEPUTIES IN REICHSTAG.
Kingdoms:				
1. Prussia,	24,691,307	139,751	17	236
2. Bavaria,	4,863,450	29,280	6	48
3. Saxony,	2,556,244	5,780	4	23
4. Wurtemberg,	1,818,539	7,532	4	17
Grand Duchies:				
5. Baden,	1,461,562	5,850	3	14
6. Hesse,	852,894	2,962	3	9
7. Mecklenburg-Schwerin,	557,897	5,136	2	6
8. Saxe-Weimar,	286,183	1,403	1	3
9. Mecklenburg-Strelitz,	96,982	1,130	1	1
10. Oldenburg,	314,777	2,470	1	3
Duchies:				
11. Brunswick,	311,764	1,425	2	3
12. Saxe-Meiningen,	187,884	955	1	2
13. Saxe-Altenburg,	142,122	510	1	1.
14. Saxe-Coburg-Gotha,	174,339	760	1	2
15. Anhalt,	203,437	896	1	2
Principalities:				
16. Schwarzburg-Rudolstat,	75,523	367	1	1
17. Schwarzburg-Sondershausen, . .	67,191	332	1	1
18. Waldeck,	56,224	438	1	1
19. Reuss (altere Linie),	45,094	123	1	1
20. Reuss (jungere Linie),	89,032	320	1	1
21. Schaumburg-Lippe,	32,059	170	1	1
22. Lippe-Detmold,	111,135	438	1	1
Free Towns:				
23. Lubeck,	52,158	110	1	1
24. Bremen,	122,402	97	1	1
25. Hamburg,	338,974	158	1	3
26. Alsace-Lorraine,	1,549,459	5,590		
	41,058,632	208,613	58	382

The *Almanac de Gotha*, for 1876, divides the population of the German Empire, in regard to nationality, as follows: Germans, 37,820,000; Poles, 2,450,000; Wends, 140,000; Czechs, 50,000; Lithuanians and Courlanders, 150,000; Danes, 150,000; French and Walloons, 210,000. The Germans admit of being divided into high and low Germans; the phraseology of the former is the cultivated language of all the German States; that of the latter, known as *Platt-Deutsch*, is spoken in the north and northwest. The Poles are found exclusively in the east and northeast of Prussia; the Czechs in Silesia, about Appeln and Breslau; the Wends, in Silesia, Brandenburg, and Prussian Lusatia; the Lithuanians and Courlanders in east Prussia; the Danes, in Schleswig; the Walloons, about Aix-la-Chapelle, in Rhenish Prussia, and the French, partly in the same region, and in Alsace and Lorraine.

Germany presents two very distinct physical formations. First, a range of high table land, occupying the centre and southern parts of the country, interspersed with numerous ranges and groups of mountains, the most important of which are the Harz and Teutoburger in the north, the Taunus and Thuringerwald in the middle, and the Schwarzwald and Raube Alps in the south, and containing an area, including Alsace and Lorraine, of 110,000 square miles. Second, a vast sandy plain, which extends from the centre of the empire north to the German Ocean, and including Schleswig-Holstein, contains an area of about 98,000 square miles. This great plain, stretching from the Russian frontier on the east to the Netherlands on the west, is varied by two terrace-like elevations. The one stretches from the Vistula into Mecklenburg, at no great distance from the coast of the Baltic, and has a mean elevation of 500 to 600 feet, rising in one point near Danzig to 1020 feet; the other line of elevations begins in Silesia, and terminates in the moorlands of Luneberg, in Hanover, its course being marked by several summits from 500 to 800 feet in height. A large portion of the plain is occupied by sandy tracts, interspersed with deposits of peat; but other parts are moderately fertile, and admit of successful cultivation.

In respect of drainage the surface of Germany belongs to three different basins. The Danube, from its source in the Schwarzwald to the borders of Austria, belongs to Germany, and through this channel the waters of the greater part of Bavaria are poured into the Black Sea, thus opening up communication with the east. The greater part of the surface, however (about 185,000 square miles), has a northern slope, and belongs partly to the basin of the North Sea, and partly to the basin of the Baltic. The chief German streams flowing into the North Sea are the Rhine, the Weser, and the Elbe; into the Baltic, the Oder and the Vistula.

The most important of the numerous canals of Germany are the Ludwig's canal, in Bavaria, connecting the Danube and Main, and thus opening a communication between the Black Sea and the German Ocean; the Finow and Friedrich Wilhelm's canals, in Brandenburg; the Plaue canal, connecting the Elbe and the Havel; and the Kiel and Eyder canal, uniting the Baltic and the German Ocean. Numerous lakes occur both in the table-land of southern Germany, and in the lowlands of the northern district, but few of them are of any great size. Mineral springs occur principally in Nassau, Wurtemberg, Baden, Bavaria, and Rhenish Prussia. Many of these springs have retained their high reputation from the earliest ages.

The climate of Germany presents less diversity than a first glance at the map might lead one to infer, for the greater heats of the more southern latitudes are considerably modified by the alpine character of the country in those parallels, while the cold of the northern plains is mitigated by their vicinity to the ocean. The average decrease in the mean temperature is in going from south to north, about 1° F. for every 52 miles; and in going from west to east, about 1° F. for every 72 miles. The line of perpetual snow varies from 7200 to 8000 feet above the level of the sea. The mean annual fall of rain is 20 inches.

The following table shows the mean temperature at different points :

	MEAN ANNUAL TEMPERATURE.	SUMMER.	WINTER.
Hamburg,	47.	64	30
Dresden,	48.	67	29
Frankfort-on-the-Main,	48.5	66	31
Berlin,	46.5	66	27
Hanover,	48.	63	33
Königsberg,	43.	62	24

Germany is rich in mineral products, among which the most important are silver, found in the Hartz mountains; iron in numerous mountain ranges; salt in many parts of the country; coal in Rhenish Prussia, Silesia. Cobalt, arsenic, sulphur, salt-petre, alum, gypsum, bismuth, pumice-stone, tripoli-slate, kaolin, emery, ochre, and vitriol, are all among the exports of Germany.

The following figures show the product of the principal mining industries of Germany (exclusive of Alsace and Lorraine) for the year 1870 :

	NO. OF WORKS.	PERSONS EMPLOYED.	PRODUCT IN CWT.	VALUE IN THALERS.
Coal (including brown coal),	1362	145,782	680,060,074	61,863,399
Iron ore,	1258	24,793	58,550,539	7,116,828
Zinc ore,	72	9,797	7,335,603	2,315,429
Lead ore,	174	18,057	2,111,810	5,511,235
Copper ore,	3	6,156	4,147,627	1,619,938

The yield of salt, for the same year, was 14,658,990 hundredweight, from 69 works, employing 4610 persons, and valued at 3,926,650 thalers.

The leading products of the metallurgical industries are given as follows :

	WORKS.	PERSONS EMPLOYED.	AMOUNT PRO- DUCED IN CWT.	VALUE IN THALERS.
Cast iron,	631	39,525	29,942,264	49,251,650
Wrought iron (including wire, bars, and manufactured iron of various kinds),	354	43,849	17,437,766	57,490,284
Steel,	216	12,892	3,399,027	22,747,626
Zinc,	53	6,256	1,727,570	10,212,259
Silver,	10	1,601	(lbs.) 185,847	5 549,943
Lead (products of),	17	1,513	1,195,753	6,951,164
Copper,	28	1,971	174,687	4,667,535

The entire production of mines, furnaces, salt works, etc., is given as 824,965,732 hundredweight, valued (including 186,270 pounds of gold and silver) at 246,482,099 thalers.

The vegetable products comprise a very large proportion of the European flora. All the ordinary cereals are extensively cultivated in the north, and largely exported, chiefly from Wurtemberg and Bavaria; hemp and flax, madder, woad, and saffron grow well in the central districts, where the vine, the cultivation of which extends in suitable localities as far north as 51°, is brought to greater cultivation—the best wine-producing districts being the valleys of the Danube, Rhine, Main, Neckar, and Moselle, which are, moreover, generally noted for the excellence of their fruits and vegetables. Tobacco is grown in sufficient quantities for extensive exportation on the Upper Rhine, the Werra, and Oder. The hops of Bavaria have a high reputation, and the chicory grown in that country and in the district between the Elbe and

the Weser finds its way all over Europe as a substitute for coffee. The average annual product of cereals is approximately as follows:

Rye,	89,000,000 hectolitres.*
Oats,	87,000,000 "
Wheat,	34,000,000 "
Barley,	30,000,000 "

The average annual potato crop amounts to 272,000,000 hectolitres. The production of beets, in 1872, was over 61,000,000 hundredweight. A fair yield of wine is about 4,500,000 hectolitres, and of tobacco, about 700,000 hundredweight.

The most extensive forests are found in central Germany, and in some parts of Prussia, while the northwestern parts of the great plain are deficient in wood, the place of which is in some degree supplied by the abundance of turf yielded by the marshy lands. Germany has long been noted for the good breed of horses raised in the northern parts of the continent, while Saxony, Silesia, and Brandenburg have an equal reputation for their sheep-flocks, and the fine quality of the wool which they yield. The rich alluvial flats of Mecklenburg and Hanover are celebrated for their cattle; the forests of northern and central Germany abound in swine, and in small game of various kinds; while the Bavarian Alps afford shelter to the larger animals, as the chamois, the red deer and wild goat, the fox, marten, and wolf.

According to the last enumeration of live stock, there were in Germany 3,500,000 horses, 15,000,000 cattle, 30,000,000 sheep, 8,000,000 swine, and 2,000,000 goats. The wool crop for 1869 amounted to 750,000 hundredweight.

Among the fishes of Germany, the most generally distributed are carp, salmon, trout, and eels; the rivers contain also crayfish, pearl-bearing mussels, and leeches. The oyster, herring, and cod fisheries constitute important branches of industry on the German shores of the Baltic and North Seas.

The preservation and cultivation of woods receive almost as much attention in Germany as agriculture, and, like the latter, are elevated to the rank of a science. The larger woods and forests in most of the states belong to the government, and are under the care of special boards of management, which exercise the right of supervision and control over all forest lands, whether public or private. The value of the forests of Germany was, in 1873, estimated at 666,000 thalers.

The oldest and most important of the German industrial arts are the manufactures of linen and woolen goods. The chief localities for the cultivation and preparation of flax, and the weaving of linen fabrics, are the mountain valleys of Silesia, Lusatia, Westphalia, the Harz, and Saxony (for thread laces); while cotton fabrics are principally made in Rhenish Prussia and Saxony. The same districts, together with Pomerania and Bavaria, manufacture the choicest woolen fabrics, including damasks and carpets. Toys, wooden clocks, and wood-carvings, which may be regarded as almost a specialty of Germany industry, are carried to the greatest perfection in the hilly districts of Saxony, Bavaria, and the Black Forest. The best iron and steel manufactures belong to Silesia, Hanover, and Saxony. Silesia probably possesses the finest glass manufactories; while Saxony and Prussia stand pre-eminent for the excellence of their china and earthen wares. Augsburg and Nuremberg dispute with Munich and Berlin the title to pre-eminence in silver, gold, and jewelry work, and in the manufacture of philosophical and musical instruments; while Leipzig and Munich claim the first rank for type foundries, printing, and lithography. The trading cities of northern Germany nearly monopolize the entire business connected with the preparation of tobacco, snuff, etc., the distillation of brandies, and the manufacture of sugar from the beet, potato, and other roots; while vinegar and oils are prepared almost exclusively in central and southern Germany.

The constitution of the empire is confederate, under the presidentship of the King of Prussia, who bears the hereditary title of German Emperor. He has the right

* The hectolitre equals 2.75 bushels.

and duty of representing the empire in all respects of international law, of declaring war in the name of the empire, making peace and treaties, etc. For a declaration of war the consent of the Bundesrath is necessary. He is the commander-in-chief of the whole army and navy, in peace as well as in war, except the military powers of Wurtemberg and Bavaria, which—in times of peace only—form separate corps under the command of their respective kings. He names and dismisses the officers and functionaries of the empire. His orders, issued in the name of the empire, must be countersigned by the Chancellor, who, as the first minister of the empire, is by his signature responsible for them.

The legislative powers lie in the *Bundesrath* and the *Reichstag*. The former consists of the delegates of the confederate governments, representing in all fifty-eight votes. The Reichstag has 382 members directly elected by the secret ballot of the people. The bills promulgated by these two assemblies in accordance are compulsory on all governments of the empire, and annul *eo ipso* all possible institutions contradictory to them in the several States.

The empire has no debt. The debts of the separate States amounted, in 1873, to 1,093,800,000 thalers, 589,300,000 of which sum was for railways.

The army consists, on a peace footing, of about 400,000 men; on a war footing, of about 1,300,000. The navy comprises 51 vessels, of which number 47 are steamers, of 77,130 horse-power, 64,198 tons burthen, and carrying 321 guns; and 4 sailing vessels (1 frigate and 3 brigs) mounting 36 guns.

The multiplicity of small States into which Germany was long broken up, opposed great obstacles to the development of commerce; but the difficulty has to some extent been obviated by the establishment of the *Zollverein*, or "Customs confederation." The Hanse Towns, Hamburg and Bremen, do not belong to it, being free ports; but it comprises all the other states of the empire and the grand duchy of Luxembourg.

The estimated value of goods exported, imported, and in transit (by the customs lines) for 1873 was as follows:

Imports,	4,257,300,000 marks.
Exports,	2,489,000,000 "
In transit,	1,233,000,000 "

The merchant navy comprised, in 1873, 4748 vessels, including 253 steamers, with a total of 1,201,358 tonnage.

The railways measured, in 1871, about 13,310 English miles; but these figures represent the length, not of the lines within the limits of the German Empire, but of those which are under German administration, though extending some way into neighboring States.

The various telegraphic lines of the empire (excepting those of Bavaria and Wurtemberg) are now under a central administration, and, in 1874, the whole measured 42,571 kilometres; length of wires, 149,410 kilometres; number of messages, 13,422,511; number of offices, 4992.

The post office forwarded in 1874:

Private letters,	521,900,000
Postal cards,	47,900,000
Official letters,	37,700,000
Parcels, etc.,	89,700,000
	<hr/>
	697,200,000
Newspapers,	349,600,000
Number of offices,	7,900

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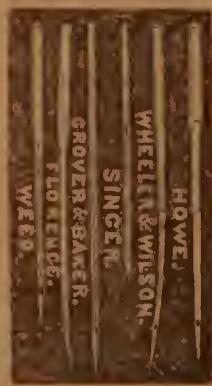
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least four or five years, is made compulsory in nearly all the German States, and hence the proportion of persons who cannot read and write is exceedingly small in Germany.

The elementary schools are 60,000 in number, and are attended by 6,000,000 pupils between the ages of six and fourteen. Of the middle schools, including 330 gymnasia and 214 pro-gymnasia and Latin schools, there were in 1873 over 1000, attended by 177,379 pupils. There are 21 universities, with (in 1873) 1620 instructors and 17,858 students. Of polytechnic schools there are ten, with 360 instructors and 4500 students. Besides these there are numerous special schools of technology, agriculture, commerce, mining, metallurgy, military science, navigation, trades, etc. The German academics of art and sciences and conservatories of music enjoy a world-wide reputation. Public libraries—of which there are more than one hundred and fifty—museums, botanical gardens, art collections, and picture galleries are to be met with in most of the capitals and many of the country towns.

Commission from the GERMAN EMPIRE to the International Exhibition:

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GERMANY.

(South of Nave, Columns 28 to 38.)

Mineral and Metallurgical Products, Mining Engineering.

Minerals, Ores, Stone, Mining Products.

STASSFURT COLLECTIVE EXHIBIT.—ROCK SALT, POTASH, FERTILIZING SALTS, AND DRAWINGS. 100

- 1 Royal Inspection of Mines, Stassfurt.
- 2 Chemical Factory, formerly Vorster & Grünberg, Stassfurt.
- 3 Chemical Factory, Leopoldshall.
- 4 Chemical Factory of Nette, Faulwasser, & Co., Leopoldshall.
- 5 Zimmer & Co., Stassfurt.
- 6 Lindeman & Co., G. Stassfurt.
- 7 Douglass, B. W. B., Westeregeln.

COLLECTIVE EXHIBIT OF PRODUCTIONS OF LEAD MINES AND FURNACES, ACCOMPANIED BY DRAWINGS. 100

- 8 Royal Prussian Furnaces, Upper Hartz; Royal Prussian and (Ducal) Brunswickian Furnaces, Lower Hartz, at Clausthal and Oker.
- 9 Royal Prussian Furnace, Friedrichshütte.
- 10 Joint Stock Association for Mining and Lead and Zinc Manufacturers, Stolberg, near Aix-la-Chapelle.
- 11 Rhenish-Nassau Co., Stolberg, near Aix-la-Chapelle.
- 12 Kasten, H. W., Hanover.—Samples of crude petroleum, etc. 101
- 13 Hack & Co., Büchen.—Peat bricks. 101
- 14 Wölfel & Herold, Bayreuth.—Gravestones. 102
- 15 Solenhofen Joint Stock Co., Solenhofen.—Tiles for malt-house floors. 102
- 16 Zimmermann, Otto, Greussen, Toptus.—Tiles. 102
- 17 Stern, Portland Cement Factory, Toepffer, Grawitz, & Co., Stettin.—Portland cement. 103
- 18 Hiller, Otto, Berlin.—Mastic roofing. 103
- 19 Roesler & Achtelstetter, Passau.—Sheets of asphalt. 103
- 20 Häusler, Carl Sam., Hirschberg in Silesia.—Wood cement. 103
- 21 Scharlach, Louis, jr., Hamburg.—Leather and asphalt roofing. 103
- 22 Solenhofen Joint Stock Co., Solenhofen.—Lithographic stones. 106

- 23 Schindel, Joh. Adam, Solenhofen.—Lithographic stones. 106
- 24 Israel Bros., Dresden.—Millstones, etc. 106
- 25 Jungfer, A., Berlin.—Amber. 107
- 26 Stantien & Becker, Berlin.—Rough amber. 107
- 27 Managers of Friedrichshall Springs, C. Oppel & Co., Friedrichshall, near Hilburghausen.—Friedrichshall natural bitter water. 107

Metallurgical Products.

- 28 Borsig, A., Berlin.—Products of mines and furnaces. 111
- 29 Burbach Furnace, Burbach.—Products of mines and furnaces. 111
- 30 Krupp, Fr., Essen.—Products of mines and furnaces. 111
- COLLECTIVE EXHIBIT, SIEGERLAND.—SPIEGELEISEN AND ORES. 111
- 31 Heinrichshutte, Au-on-Sieg.
- 32 Joint Stock Co., Cologne Müsen.
- 33 Joint Stock Co., Charlottenhütte.
- 34 Wissen Joint Stock Co., Wissen.
- 35 Mine Owners of Siegerland.

- 36 Westphalian Union Joint Stock Co. for Mining and for Iron and Wirework, Hamm.—Wire. 111
- 37 Vennemann & Co., Bochum.—Iron and cast steel wire rope. 111
- 38 Lohmann & Söding, Witten.—Polished steel ware. 111
- 39 Schlieper, H., Son, Grüne, near Iserlohn.—Polished iron chains. 111
- 40 Hirsch, Aron, & Son, Brass Works at Neustadt-Eberswalde.—Seamless brass tubes, etc. 112
- 41 Fleitmann & Witte, Iserlohn.—Nickel goods. 113
- 42 Ruffer & Co., Breslau.—Sheet zinc. 113

Mining Engineering.

- 43 Royal Prussian Department of Commerce, section for Mines, Furnaces, and Salt Works, and National Geological Institution, Berlin.—Maps, plans, and books. 120
- 44 Nörr, Eugene, Berlin.—Work on lighting and ventilating mines. 120
- 45 Gödecke, Carl, Gelsenkirchen.—Plans of the Gelsenkirchen furnaces. 120

AUSTRIA.—STATISTICAL PREFACE.

THE Austrian Empire forms, on the whole, a compact territory with a circumference of about 5349 miles. It is included between 42° to 51° north latitude, and between 8° 20' to 26° 20' east longitude. The body of the empire lies in the interior of the European continent, though, by means of the southern projection of Dalmatia, it has about 1200 miles of sea-coast on the Adriatic. With the rest of its circumference, it borders on the States of the Church, Modena, Parma, Italy, Switzerland, Bavaria, Saxony, Prussia, Russia, Moldavia, Wallachia, Servia, Turkey, and Montenegro. Its present provinces embrace an area of 241,123 square miles, and a population which, in 1869, amounted to 35,904,435.

The following table gives the area, number of civil inhabitants, and total population, civil and military, of the various provinces of the empire—distinguishing its two great political divisions, the German monarchy, or Cisleithan Austria, and the Hungarian kingdom, or Transleithan Austria, together with the so-called military frontier, placed under the administration of the ministry of war for the whole empire—according to the official returns for 1869:

PROVINCES.	AREA IN ENGLISH SQ. MILES.	CIVIL POPULATION.	TOTAL POPULATION.
GERMAN MONARCHY.			
Lower Austria,	7,658	1,954,251	1,990,708
Upper Austria,	4,634	731,579	736,557
Salzburg,	2,768	151,410	153,159
Styria,	8,674	1,131,309	1,137,990
Carinthia,	4,007	336,400	337,694
Carniola,	3,858	463,273	446,334
Coast Land,	3,085	582,079	600,525
Tyrol and Vorarlberg,	11,321	878,907	885,789
Bohemia,	20,763	5,106,069	5,140,544
Moravia,	8,579	1,997,897	2,017,274
Silesia,	1,988	511,581	513,352
Galicia,	30,320	5,418,016	5,444,683
Bukowena,	4,037	511,964	513,404
Dalmatia,	4,942	442,796	456,961
Total German Monarchy,	116,634	20,217,531	20,934,980
KINGDOM OF HUNGARY.			
Hungary,	82,867	11,117,623	11,118,502
Croatia and Slavonia,	7,445	1,160,085	1,164,806
Transylvania,	21,222	2,101,727	2,115,024
Military Frontier,	12,956	1,037,892	1,041,123
Total Hungary,	124,490	15,417,327	15,509,455
Total Austro-Hungary,	241,124	35,634,858	35,904,435

Three-fourths of Austria is mountainous or hilly, being traversed by three great mountain chains—the Alps, Carpathians, and Sudetes, whose chief ridges are of primitive rock. The Alps are accompanied, north and south, by parallel ranges of calcareous mountains, covering whole provinces with their ramifications. The Carpathians are lapped on their northern side by sandstone formations; mountains of the

same character also occupy Transylvania. Springing from the northwest bend of the Carpathians, the Sudetes run through the northeast of Moravia and Bohemia, in which last the range is known as the Riesen gebirge, or Giant mountains. Continuous with this range, and beginning on the left bank of the Elbe, are the Erzgebirge, or Ore mountains, on the confines of Saxony; and veering round to nearly southeast, the range is further prolonged in the Bohemian Forest mountains, between Bohemia and Bavaria. The chief plains of the Austrian empire are: the great plains of Hungary (the smaller of these is in the west, between the offsets of the Alps and Carpathians, and is about 4200 square miles in extent; the other, which is in the east, and traversed by the Danube and the Theiss, has an area of 21,000 square miles), and the plains of Galicia.

From the south point of Dalmatia to the boundary of Italy, Austria has a sea-line of about 1000 miles, not counting the coasts of the numerous islands, the largest of which is Veglia, 23 miles by 12. The chief lakes are: the Platten See, and the Neusiedler See, both in Hungary. The first is navigable by steamers, and both are rich in fish, and have fruitful vineyards around them. The Alps and Carpathians inclose numerous mountain lakes, which are surrounded with wood and rock, and all the other attributes of picturesque scenery. The Long lake in the Tatra mountains lies at an elevation of 6000 feet. The most remarkable of all is the Zirknitz lake, in Illyria. There are extensive swamps or morasses in Hungary. One connected with the Neusiedler See covers some 80 square miles. A good deal has been done in the way of reclaiming lands by draining morasses.

The leading rivers that have navigable tributaries are: the Danube, which has a course of 849 miles within the Austrian dominions, the Vistula, the Elbe, and the Dniester. The Rhine bounds Austria for about fourteen miles above Lake Constance.

The climate of Austria is on the whole very favorable; but from the extent and diversity of surface, it presents great varieties. In the warmest southern region, between 42° to 46° latitude, rice, olives, oranges, and lemons ripen in the better localities; and wine and maize are produced everywhere. In the middle temperate region from 46° to 49° , which has the greatest extent and diversity of surface, the vine and maize still thrive in perfection. In the northern region, beyond 49° , except in favored spots, neither the vine nor maize succeeds; but grain, fruit, flax, and hemp, thrive excellently. The mean temperature of the year is, at Trieste, 58° F.; at Vienna, 51° ; at Lemberg, in Galicia, 44° .

The raw products of Austria are abundant and various; and in this respect it is one of the most favored countries in Europe. Its mineral wealth is not surpassed in any European country; it is only lately that Russia has exceeded it in the production of gold and silver. Mining has been a favorite pursuit in Austria for centuries, and has been encouraged and promoted by the government. Bohemia, Hungary, Styria, Carinthia, Salzburg, and Tyrol, take the first place in respect of mineral produce. Except platina, none of the useful metals is wanting. The mines are partly State property, and partly owned by private individuals. Gold is found chiefly in Hungary and Transylvania, and in smaller quantity in Salzburg and Tyrol. The same countries, along with Bohemia, yield silver. The discovery of quicksilver at Idria first brought this branch of mining industry into importance. This metal is now also found in Hungary, Transylvania, Styria, and Carinthia. Copper is found in many districts—tin, in Bohemia alone. Zinc is got chiefly in Cracow and Carinthia. The most productive lead mines are in Carinthia. Iron is found in almost every province of the monarchy, though Styria, Carinthia, and Carniola are chief seats. The production, though great, is not yet equal to the consumption. Antimony is confined to Hungary; arsenic is found in Salzburg and Bohemia; cobalt in Hungary, Styria, and Bohemia; sulphur in Galicia, Bohemia, Hungary, Venice, Salzburg, etc., though not enough to supply home consumption. Graphite is found abundantly in Bohemia, Moravia, Carinthia, etc.

The useful earths and building-stones are to be had in great profusion ; all sorts of clay up to the finest porcelain earth (in Moravia, Bohemia, Hungary, Venice), and likewise marble, gypsum, chalk, etc. Of precious and semi-precious stones are the Hungarian opal, which passes in commerce as oriental, Bohemian garnets—the finest in Europe—cornelians, agates, beryl, amethyst, jasper, ruby, sapphire, topaz, etc.

The following table shows the principal metals and minerals produced in Austria in 1867, and their average value in florins at the place of production :

	WEIGHT.	VALUE IN FLORINS.
Gold (Austrian pound),	3,562	2,406,041
Silver “	81,378	3,655,643
Quicksilver (Austrian hundredweight),	5,944	723,958
Tin “ “	591	33,812
Zinc “ “	40,296	495,956
Copper “ “	47,930	2,377,840
Lead and litharge “ “	136,668	1,770,884
Iron, raw and cast “ “	5,705,761	16,709,039
Graphite “ “	279,355	271,123
Mineral coal “ “	108,488,390	17,322,283

Austria is peculiarly rich in salt. Rocksalt exists in immense beds on both sides of the Carpathians, chiefly at Wieliczka and Bochnia, in Galicia, and in the country of Marmaros in Hungary, and in Transylvania. The annual produce of rock-salt is greatly above three million hundredweight. Salt is also made at State salt-works by evaporating the water of salt-springs. The chief works are those at Hallstadt, Ischl, Hallein, and Hall in Tyrol. From two to three millions hundredweight are thus produced annually. A considerable quantity is also made from sea-water on the coast of the Adriatic. Of other salts, alum, sulphate of iron, and sulphate of copper are the chief. Austria has abundance of mineral springs, frequented for their salubrity ; 1600 are enumerated, some of them of European reputation, as the sulphurous baths of Baden, in lower Austria, the saline waters of Karlsbad, Marienbad, and Ofen, etc.

The vegetable productions, as might be expected from the vast diversity in the soil and position of the different provinces, are extremely various. Although three-fourths of the surface is mountainous, more than five-sixths is productive, being used either for tillage, meadows, pasture, or forest. Grain of all kinds is cultivated most abundantly in Hungary and the districts south of it on the Danube, in Bohemia, Moravia, Silesia, and Galicia. Agriculture is not yet far advanced ; the prevailing system is still what is called the three-field system, introduced into Germany by Charlemagne, in which a crop of winter wheat is followed by one of summer grain, and that by fallow.

In Hungary, the Magyar adheres to his primitive husbandry ; the German and Slave are adopting improved methods. Rice is cultivated in the Banat, but not enough for the consumption. Potatoes are raised everywhere ; and in elevated districts, are often the sole subsistence of the inhabitants. Horticulture is carried to great perfection ; and the orchards of Bohemia, Austria proper, Tyrol, and many parts of Hungary, produce a profusion of fruit. Great quantities of cider are made in upper Austria and Carinthia, and of plum brandy in Slavonia. In Dalmatia, oranges and lemons are produced, but not sufficient for the requirements of the country ; twice as much olive oil is imported as is raised in the monarchy.

In the production of wine, Austria is second only to France. With the exception of Galicia, Silesia, and upper Austria, the vine is cultivated in all the provinces ; but Hungary stands first, yielding not only the finest quality of wine, but four-fifths the amount of the whole produce of the empire. The average produce of the whole empire is estimated at about 680 millions of gallons.

Of plants used in manufactures and commerce, the first place is held by flax and

hemp. Flax is cultivated almost universally; white hemp in Galicia, Moravia, Hungary, etc. Tobacco is raised in great quantities, especially in Hungary, which also is first in the cultivation of rapeseed. Bohemia raises hops of the first quality, which are partly exported, though other provinces import from abroad. The indigo plant has lately been successfully acclimatized in Dalmatia. More than a third of the productive surface is covered with wood (75,000 square miles), which, besides timber, yields a number of secondary products, as tar, potash, charcoal, bark, cork, etc.

As to animals, bears are found in the Carpathians, Alps, and Dalmatia; wolves, jackals, and lynxes in these same districts, and also in the Banat, Croatia, Slavonia, and the military frontiers. The marmot, otter, and beaver are also found in Dalmatia. Game has of late sensibly diminished. The wild goat lives in the highest, the chamois and white Alpine hare in the middle regions of the Alps and Carpathians. More productive than the chase are the fisheries of the Danube, Theiss, and numerous streams, lakes, and ponds. The chief sea-fishing is in Dalmatia. Leeches, procured chiefly in Hungary and Moravia, form an article of considerable trade. For foreign commerce, the most important branch of rural industry is the rearing of silk.

Austria produces about a quarter a million of silk cocoons annually. The silk trade is very extensive on the Tyrol—the yearly supply of cocoons in that country being about 32,000.

In 1851, the number of horses in the monarchy was stated at 3,229,884 (not including 75,000 belonging to the army); cattle, 10,410,484; sheep, 16,801,545; goats, 2,275,900; and swine, 7,401,300. Nearly three-fourths of the population are engaged in husbandry, so that Austria is decidedly an agricultural State, though its capabilities in this respect have by no means been fully developed.

The annual value of its manufactures—not including small trades—is estimated at 1000 to 1200 millions of florins, while that of its husbandry may reach 3000 millions. Bohemia takes the lead in this industry; then follow Austria proper, Moravia and Silesia, Hungary. Vienna is the chief seat of manufacture for articles of luxury; Moravia, Silesia, and Bohemia for linen, woolen, and glass wares; Styria and Carinthia for iron and steel wares. The chief manufactured articles of export are silken and woolen; the only others of consequence are linen, twist, glasswares, and cotton goods. The yearly value of manufactured iron is about fifty-four millions of florins. The glasswares of Bohemia are of special excellence. The hemp and flax industry is one of the oldest and still most important.

No branch of industry has risen more rapidly than that of cotton. The annual value of the silk industry is estimated at about sixty millions of florins. The manufacture of tobacco is a State monopoly, and produced a revenue in 1873 of 58,126,000 florins. The salt monopoly secured 18,720,000 florins.

The imports for the year 1874 were 565,600,000 florins; the exports were 452,200,000 florins. This is exclusive of Dalmatia—not within the imperial line of customs. The figures for Dalmatia were, during the same year: 9,600,000 florins imports, and 6,600,000 florins exports.

The merchant navy, at the beginning of 1875, comprised 7203 vessels, with a tonnage of 332,005, and an equipment of 27,381 seamen. Of great importance for the commerce of the empire is the Austrian Lloyds. This company owned, on the 1st of January, 1874, a fleet of seventy-six steamers, of 15,800 horse-power.

Since the year 1867 Austria has been a twofold empire, consisting of a German or "Cisleithan" monarchy—Austria proper; and a Magyar or Transleithan kingdom—Hungary. Each of the two countries has its own laws, parliament, ministers, and government; and the formal tie between them is a body known as the Delegations. These form a parliament of 120 members; one-half is chosen by the legislature of Austria, and the other by that of Hungary, the upper house of each returning twenty, the lower house forty delegates. The delegations have jurisdiction over all

matters affecting the common interests of the two countries, especially foreign affairs, war, and finance. The acts of the delegations require to be confirmed by the representative assemblies of their respective countries.

The administration of Austria proper is divided among nine ministries—Foreign Affairs, Police, Public Education, Agriculture and Public Works, Finance, Interior, War and Navy, Commerce, and Justice. The Reichsrath consists of an upper and a lower house. The upper house is constituted by princes, nobles, archbishops, bishops, and life members nominated by the emperor. To give validity to bills passed by the Reichsrath, the consent of both chambers is required, as well as the sanction of the emperor.

The executive of Hungary is carried on in the name of the king by a responsible ministry.

The budget for 1875 gives, for Austria proper,

Total expenditures,	382,231,049
“ receipts,	373,089,899
Deficit,	9,141,150 florins.

For Hungary—Total expenditures,	233,804,075
“ receipts,	212,138,518
Deficit,	21,665,557 florins.

The public debt of Austria, on the 1st of January, 1875, was 2,649,484,475 florins; that of Hungary, January 1st, 1873, was 488,717,380 florins.

According to official returns, Austria possessed, in 1875, a standing army numbering 284,435 men on the peace footing, and 785,649 on the war footing.

The naval forces consisted of sixty-nine vessels, of a tonnage of 115,380, carrying 263 heavy and 87 light guns. Of this fleet, 47 vessels were steamers, of 100,260 tons burthen, carrying 263 heavy and 87 light guns.

The length of railways, at the close of 1875, was

In Austria,	9,823 kilometres.
“ Hungary,	6,415 “
Total,	16,238 “

The work of the post office in Austria-Hungary for 1874 was as follows :

Letters,	253,909,000
Postal cards,	28,741,000
Parcels,	31,959,000
Newspapers,	82,085,000
Number of post offices,	6,296

The statistics of telegraphs for the year 1874 are as follows :

Length of lines (Austria-Hungary),	45,441 kilometres.
“ “ wires “ “	129,171 “
Number of offices,	2,923 “
“ of dispatches,	5,797,492 “

Education, since 1849, is under the care of a Minister of Public Worship and Instruction. In the major part of German Austria the law enforces the compulsory attendance in the “ Volksschulen,” or National Schools, of all children between the ages of six and twelve, and parents are liable to punishment for neglect. It is rarely, however, that cases occur in which penalties for non-attendance at school have to be enforced. The cost of public education mainly falls on the communes, but of late

years the State has come forward to assist in the establishment of schools for primary education.

There are seven universities in the empire. Four of these, the high schools at Vienna, Prague, Graz, and Innsbruck, are called German universities, and were attended as follows, in 1872 :

	PROFESSORS AND TEACHERS.	STUDENTS.
Vienna,	200	3881
Prague,	97	1709
Graz,	70	926
Innsbruck,	58	612

Of the other universities, Pesth, the high school of Hungary, had 2500 students at the end of 1873, and Cracow and Lemberg, the high schools for Galicia and the other Slavonian provinces, had, at the same date, together, 1900 students.

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AUSTRIA.

(South of Nave, Columns 23 to 28.)

Mining and Metallurgy.

Minerals, Ores, Stone, Mining Products.		7 Legrady, Joseph, Vienna.—Glaziers' diamonds and artificial steel glass cutters. 106	
1 Fric, V., Prague.—Minerals, fossils. 100		8 Nedwied & Son, Schlan, Bohemia.—Red chalk, red-lead pencils. 107	
2 Tugoviz, A., Klagenfurt.—Ore and mining products of Karnten. 100		9 Saxlehner, Andreas, Budapest.—Hunyadi János mineral water. 107	
3 Chief Mountain and Mining Administration, Pozoritta, Bukowina.—Pyrolusite for aniline pigments for soda factories, German silver ware, and manganese products. 100		10 Mineral Water Direction, Pullna, near Brüx, Bohemia.—Mineral water. 107	
4 Loos, Adolf, Brunn.—Moravian white marble, manganese. 102		11 Loser Bros., Budapest.—Genuine mineral water from the Ofen-Rakoczy spring. 107	
5 Muhldorf Graphite Factory, Muhldorf, near Spitz, Lower Austria.—Graphite. 105		Metallurgical Products.	
6 Genthe, Adolph, Lichtenau, near Gföhl, Lower Austria.—Graphite. 105		12 Industry Association in Krain, Laibach.—Iron and steel mountain and mining works. Ferro-manganese and spiegel iron. 111	

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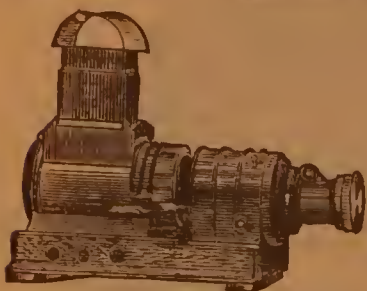
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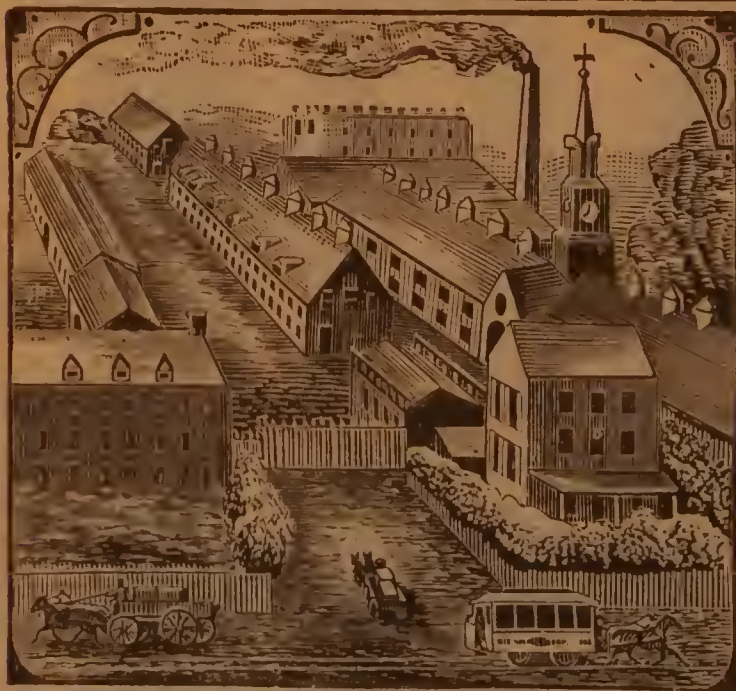


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SWITZERLAND.—STATISTICAL PREFACE.

SWITZERLAND is an inland country of Europe, situated between $45^{\circ} 48'$ and $47^{\circ} 49'$ north latitude, and $5^{\circ} 55'$ and $10^{\circ} 30'$ east longitude. Its greatest length from east to west is 180 miles, and its greatest width from north to south, 130 miles.

The following table gives the area and population of each of the 22 cantons, according to the census returns of 1870:

	ENGLISH SQUARE MILES.	POPULATION.
Graubünden,	2,968	91,782
Bern,	2,561.5	506,465
Wallis (Valais),	1,661.6	96,887
Vaud (Waadt),	1,181.9	231,700
Ticino (Tessin),	1,034.7	119,619
St. Gallen,	747.7	191,015
Zurich,	685.3	284,786
Luzern,	587.4	132,338
Fribourg (Freiburg),	563.9	110,832
Aargau,	502.4	198,873
Uri,	420.8	16,107
Schwyz,	338.3	47,705
Neuchatel (Neuenburg),	280.2	97,284
Glarus,	279.8	35,150
Thurgau,	268.3	93,300
Unterwalden,	262.8	26,116
Solothurn,	254.6	74,713
Basle,	184.6	101,887
Appenzell,	152.8	60,635
Schaffhausen,	119.7	37,721
Geneve (Genf),	91.3	93,239
Zug,	85.4	20,993
Total,	15,233.0	2,669,147

Switzerland is the most mountainous country of Europe. Its principal chains are the Alps and the Jura. The former run from east to west along its southern or Italian frontier. Their ramifications fill more than one-half the country, and terminate along a line which may be traced from Vevey, on the lake of Geneva, to Mount Moleson and Mount Napf, across Lake Zug, to the southern shores of the lakes of Zurich and Wallenstadt, and Sargans on the Rhine. The mean elevation of the highest chain is from 8000 to 9000 feet. The Jura run northeast from the western corner of Switzerland. They consist of a series of parallel ridges inclosing long and narrow valleys, and their mean elevation does not exceed 4000 feet. In the angle formed between them and the Alps lies the plain of Switzerland, a table-land 100 miles in length, and from 20 to 30 miles in width, with a mean elevation of about 1400 feet above the sea. It is not absolutely level, but covered with elevations which seem very unimportant when contrasted with the huge masses of the Alps and Jura. The communication between the plain of Switzerland and the German valleys of the Danube and Rhine is not continuous. The plain terminates in the east in a third hilly tract, the Thur hill country, which lies between the lakes of Zurich and Constance, and, to some extent, forms a barrier between the plain of Switzerland and Germany. The Jura, the plain, and the hill country, are the three great divisions of northern Switzerland. The divisions in the Alpine region are more strongly marked

in nature. They isolate and inclose (1) the valleys drained by the Rhone which connect Switzerland with southern France; (2) Ticino, drained by streams which descend to the Po, and bring this section into communication with Italy; (3) the Grisons, the most sequestered valleys of Switzerland, drained by the tributaries of the Rhine and Danube, and shut out by mountains from the lower basins of these rivers; (4) Bernese Oberland, which slopes towards the western extremity of the Swiss plain; (5) the district of the Forest Cantons, Schwyz, Uri, and Unterwalden, surrounding the Lake of Lucerne.

In Switzerland the climate chiefly varies with the elevation above the sea level. At a height exceeding 9500 feet the mountains are covered with perpetual snow, which descends along the glaciers to a much lower level, and thus covers the elevated part of the country with a vast sea of ice. Below the level of perpetual snow the surface of Switzerland has been divided into a series of belts, characterized by different climates and productions. The highest of these, lying between the snow and the level of 6900 feet, has been called the Upper Alpine region. In it the glaciers fill the valleys, but plants clothe the scanty soil of the ridges. The second or Lower Alpine belt descends to 4800 feet, and is a country of pastures in which shrubs, but no trees, are seen. In the third belt, which descends to 4350 feet, meadows still abound, but forests of firs and maples, in many parts, replace them. The fourth belt sinks to 3000 feet. Here forests still abound, the beech being the prevailing tree; the meadows are excellent, and rye and barley are successfully cultivated. The fifth belt descends to 1800 feet. In it the oak and walnut are the characteristic forest trees. Spelt and the best wheat are cultivated. The last belt sinks to 750 feet. In it the chestnut is the characteristic tree; the mulberry and vine are extensively cultivated, and wheat is the grain chiefly grown. This belt includes the greater part of the Swiss plain, and sinks to its lowest level in the valley of the Rhine, between Constance and Basle, and the banks of Lake Zurich and Lago Maggiore. In the last district the vegetation is that of northern Italy. The most populous part of Switzerland lies between 1250 and 2150 feet. The temperature of this region is fairly represented by that of Zurich, which averages, for the year, 47.95°.

The German language is spoken by the majority of the inhabitants in sixteen cantons, the French in four, and the Italian in two. It is reported in the census returns of 1870 that 384,561 families speak German, 134,183 French, and 30,293 Italian. According to the same returns there were but five towns in Switzerland with more than 20,000 inhabitants, namely, Geneva, seat of the watch and jewelry industry, with 46,783; Basle, centre of the silk industry, with 44,834; Bern, political capital, with 36,001; Lausanne, with 26,520; and Zurich, with 21,199 inhabitants. The soil is pretty equally divided among the population, it being estimated that four-fifths of the inhabitants are land owners. Of every 100 square miles of land 20 are pasture, 17 forest, 11 arable, 20 meadow, 1 vineyard, and 30 uncultivated, or occupied by lakes, rivers, and mountains.

According to the census of 1870 there are 2,095,447 individuals supported, either wholly or in part, by agriculture. At the same date, the manufactories employed 216,468 persons, the handicrafts 241,425. In the canton of Basle the manufacture of silk ribbons employs 6000 persons, with a total annual production valued at \$7,000,000. In the canton of Zurich silk stuffs, to the value of about \$8,000,000, are made by 12,000 operatives. The manufacture of watches and jewelry in the cantons of Neuchatel, Geneva, Vaud, Bern, and Solothurn, employ 36,000 workmen, who produce annually 500,000 watches—three-sevenths gold, four-sevenths silver—valued at \$9,000,000. In the cantons of St. Gall and Appenzell, 6000 workers make \$2,000,000 worth of embroidery annually. The printing and dyeing factories of Glarus turn out goods to the value of \$30,000 per annum. The manufacture of cotton goods occupies upwards of 1,000,000 spindles, 4000 looms, and 20,000 operatives, besides 38,000 hand-loom weavers.

The Federal custom house returns classify all imports and exports under three chief headings, namely, live stock, *ad valorem* goods, and goods taxed per quintal. No returns are published of the value of imports or exports: only the quantities are given. The following table shows the imports and exports during the year 1871:

IMPORTS.

Live stock,	256,851 head.
Agricultural instruments, carts, and railway carriages for travelers and merchandise, <i>ad valorem</i> ,	1,043,991 francs.
Goods taxed per quintal, including loads reduced to quintals,	25,450,359 quintals.

EXPORTS.

Live stock,	127,490 head.
Wood and coal, <i>ad valorem</i> ,	5,351,941 francs.
Goods, per load and quintal,	4,086,646 quintals.

The present constitution vests the supreme legislative and executive authority in a parliament of two chambers, a Ständerath, or State Council, and a Nationalrath, or National Council. The first is composed of 44 members, chosen by the 22 cantons—2 for each canton. The Nationalrath consists of 135 representatives, chosen by popular vote, at the rate of one deputy for every 20,000 souls. A general election for representatives takes place every three years. Both chambers united are called the Bundesversammlung, or Federal Assembly, and as such represent the supreme government of the republic. The chief executive authority is deputed to a Bundesrath, or Federal Council, consisting of seven members elected for three years by the Federal Assembly. The president and vice-president of the Federal Council are the first magistrates of the republic. Both are elected by the Federal Assembly for the term of one year, and are not re-eligible until after the expiration of another year. Independent of the Federal Assembly, though issuing from the same, is the Bundes-Gericht, or Federal Tribunal, consisting of eleven members, elected for three years. The Federal Tribunal decides, in the last instance, on all matters in dispute between the various cantons, or between the cantons and the Federal government, and acts in general as a high court of appeal. Each of the Swiss cantons and demi-cantons has its local government, different in organization in most instances, but all based on the absolute sovereignty of the people.

In the budget estimates for the year 1875 the total revenue is set down at 39,516,000 francs,* and total expenditure at 39,266,000 francs. The public debt of the republic amounted, at the commencement of 1875, to 30,635,552 francs, as a set-off against which there was a so-called Federal fortune, or property belonging to the State, valued at 31,783,303 francs.

The fundamental laws of the republic forbid the maintenance of a standing army within the limits of the confederation. The troops are divided into three classes: 1, the Bundes-Auszug, or Federal army, consisting of all men able to bear arms from the age of 20 to 30; 2, the army of reserve, consisting of all men who have served in the first class, from the age of 31 to 40; 3, the Landwehr, or militia, comprising all men from the 41st to the completed 44th year. The strength of the armed forces of Switzerland, at the end of 1874, was as follows:

Staff,	841
Bundes-auszug,	84,369
Reserve,	50,069
Landwehr,	65,981
Total,	201,260

* One franc = 19.3 cts. gold.

From official returns it appears that the railways open for public traffic in Switzerland had, at the end of 1874, a total length of 1024 English miles.

The post office of Switzerland forwarded, during the year 1874, 63,252,884 letters; 19,925,200 packets, and 45,651,344 newspapers.

At the end of September, 1875, there were 3736 miles of telegraph lines and 9538 miles of wires. The number of messages sent, in the year 1874, was 2,625,104; number of offices, 815. The entire telegraph system belongs to the State.

In no country is elementary instruction more widely diffused. Parents are compelled to send their children to school from five to eight, but not above that age. There are universities on the German model at Basle, Bern, and Zurich, and academies on the French plan at Geneva and Lausanne. The number of clubs for scientific, literary, musical, and social purposes, is remarkable. There are few pursuits to which any class of men can devote themselves which are not represented in Switzerland by societies.

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W. ITSCHNER, Vice-Consul.

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SALVISBERG, Architect.

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JOHN E. JEELY, of Basle, Engineer.

JOSEPH BEELER, of Wusen, Secretary.

SWITZERLAND.

(North of Nave, Columns 52 to 55.)

Minerals, Metallurgical Products.

Minerals, Ores, Stone, Mining Products.

1 Neuchatel Asphalte Co., Limited,
Travers, Ct. Neuchâtel.—Natural and
mastic asphalt. 101

2 Zbinden, F., Lausanne, Ct. Vaud.—
Anti-oxyd. 106

(The minerals illustrating the geological formations traversed by the St. Gothard tunnel are classified in this catalogue, together with the other exhibits of the St. Gothard Railroad Co., under Dept. III, Class 332.)

Metallurgical Products.

3 Bürgin Bros., Schaffhausen.—Phosphate of bronze, different compositions, with strength and fracture tests. 114

BELGIUM.—STATISTICAL PREFACE.

BELGIUM lies between latitude $49^{\circ} 27'$ and $51^{\circ} 30'$ north, and between longitude $2^{\circ} 33'$ and $6^{\circ} 5'$ east. It is bounded on the north by Holland; on the east by Dutch Limbourg, Luxembourg, and Rhenish Prussia; on the south and southwest by France; and on the northwest by the North Sea. Its greatest length, from northwest to southeast, is 173 English miles; and its greatest breadth, from north to south, 112 English miles. The whole area is 11,313 square miles. The following table gives a list of the provinces in Belgium, with the area, population, and chief town of each:

PROVINCES.	AREA IN SQ. MILES.	POPULATION (1870).	CHIEF CITIES.
Antwerp,	1,094	492,482	Antwerp.
West Flanders,	1,243	668,976	Bruges.
East Flanders,	1,154	837,726	Ghent.
Hainault,	1,430	896,285	Mons.
Liege,	1,111	592,177	Liege.
Brabant,	1,260	879,814	Brussels.
Limbourg,	929	200,336	Hasselt.
Luxembourg,	1,695	205,784	Arlon.
Namur,	1,397	313,525	Namur.
Total,	11,313	5,087,105	

Belgium is the most densely populated country in Europe, the population being about 404 to the square mile; and in the particular provinces of East Flanders, Brabant, Hainault, and West Flanders, respectively, not less than 675,594,537, and 502 to the square mile. The mural population bears to that of the towns a proportion of about 3 to 1. About 58 per cent. of the inhabitants are Flemish, the rest Walloon and French, with 39,000 Germans in Luxembourg. Belgium is, on the whole, a level and even low-lying country; diversified, however, by hilly districts. In the southeast, a western branch of the Ardennes highlands makes its appearance, separating the basin of the Maas from that of the Moselle, but attains only the moderate elevation of 2000 feet. In Flanders the land becomes so low that in parts where the natural protection afforded by the downs is deficient, dikes, etc., have been raised to check the encroachments of the sea. In the northeast part of Antwerp, a naturally unfertile district named the Campine, and composed of marshes and barren heaths, extends in a line parallel with the coast. The once impassable morasses of the *Morini* and the *Menapii*, which stayed the progress of Cæsar's legions, are now drained, and converted into fertile fields, surrounded by dense plantations, which make the land at a distance look like a vast green forest—though, when more closely regarded, we see only numerous dwellings interspersed among fields, canals, and meadows.

The abundant water-system of Belgium is chiefly supplied by the rivers Scheldt and Maas, both of which rise in France, and have their embouchures in Holland. At Antwerp, the Scheldt, which, like the Maas, is navigable all through Belgium, is 32 feet deep, and about 480 yards wide. Its tributaries are the Lys, Dender, and Rupel. The Maas, or Meuse, receives in its course the waters of the Sambre, the Ourthe, and the Roer. These natural hydrographical advantages are increased by a system of canals which unite Brussels and Louvain with the Rupel, Brussels with Charleroi, Mons with Conde, Ostend with Bruges and Ghent, and this last place with Terneuse. The climate of Belgium, in the plains near the sea, is cool, humid, and somewhat unhealthy; but in the higher southeast districts, hot summers alternate with very cold winters. April and November are always rainy months. The geological formations

of Belgium are closely associated with France and Britain. The greater portion of the country is covered with tertiary deposits. A line drawn across the course of the Scheldt, by Mechlin, along the Demer and Maas, will have on its northern and northwestern aspect a tract of tertiary deposits, bounded northwards by the sea. In these tertiary strata the different geological periods are fully represented; but only the second, containing the Pleiocene deposits, is rich in fossils. The secondary deposits occupy an extensive tract in the centre of Belgium, between the Scheldt and the Demer. The most important district, economically, is the southwestern, consisting of palæozoic rocks—Silurian, Devonian, and Carboniferous. These beds have a very complicated structure, from the numerous and extensive flexures and folds they have undergone, and these are often accompanied with great upward shifts, by which beds of many different ages are brought to the same level. Belgium is rich in minerals, which, next to its abundant agriculture, constitute the chief source of its national prosperity. The four provinces in which they are found are Hainault, Namur, Liege, and Luxembourg. They include lead, copper, zinc, calamine, alum, peat, marble, limestone, slate, iron, and coal. Lead is wrought, but only to a small extent, in Liege; copper in Hainault and Liege; manganese in Liege and Namur; black marble at Dinant; slates at Herbemont; and calamine principally at Liege. But these products are insignificant compared to the superabundance of coal—from anthracite to the richest gas coal—and iron.

In the year 1871, the total coal production of Belgium amounted to 13,733,176 tons, of a total value of 153,803,000 francs. Number of hands employed in the coal mines of Belgium, 94,186. The average daily pay of the workmen, in 1871, was $2\frac{3}{4}$ francs per day; average cost of production, $9\frac{1}{2}$ francs per ton of coal. The Ardennes districts yield a large supply of wood; while the level provinces raise all kinds of grain—wheat, rye, barley, oats, etc., leguminous plants, hemp, flax, colza, tobacco, hops, dye-plants, and chicory. Belgium contains upwards of 7,000,000 acres, of which one-half is arable, rather more than one-fifth in meadow and pasture, the same in woods and forests, and not above 500,000 acres lying waste. Some hundreds of acres are devoted to vineyards, but the wine produced is of an inferior quality. The forests of Ardennes abound in game and other wild animals. Good pasturage is found on the slopes and in the valleys of the hilly districts, and in the rich meadows of the low provinces. Gardening occupies not less than 130,000 acres; indeed, it has been said that the agriculture of Belgium is just gardening on a large scale, so carefully and laboriously is every inch of soil cultivated. The spade is still the principal instrument used. In the Campine, the care of bees is very productive, and the cultivation of the silkworm is encouraged. There are valuable fisheries on the coast, which, in 1871, employed 263 boats, with a tonnage of 8963. Belgium is famous for its horses, and in one year contained 294,537 of these animals, 1,203,891 horned cattle, and 662,508 sheep.

Wool is the object of an immense industry, the woollen manufactures of Verviers and its environs alone employing a population of 50,000 operatives. Flannels, serges, camlets, carpets, flax fabrics, silks, velvets, fine laces, ribbons, hosiery, hats, paper, etc., are extensively and profitably manufactured. The working of metals, as iron, copper, and tin, is very important; the manufacture of cannon, firearms, and locomotive engines being an especial feature of the metallurgical industry of Belgium.

The foreign trade of Belgium is officially divided into "general commerce," including the sum total of all international mercantile intercourse, and "special commerce," comprising such imports as are consumed within and such exports as have been produced in the country. The following table gives the value of both the general and special exports for the year 1873:

General imports,	2,424,800,000 francs.
" exports,	2,164,900,000 "
Special imports,	1,422,700,000 "
" exports,	1,158,600,000 "

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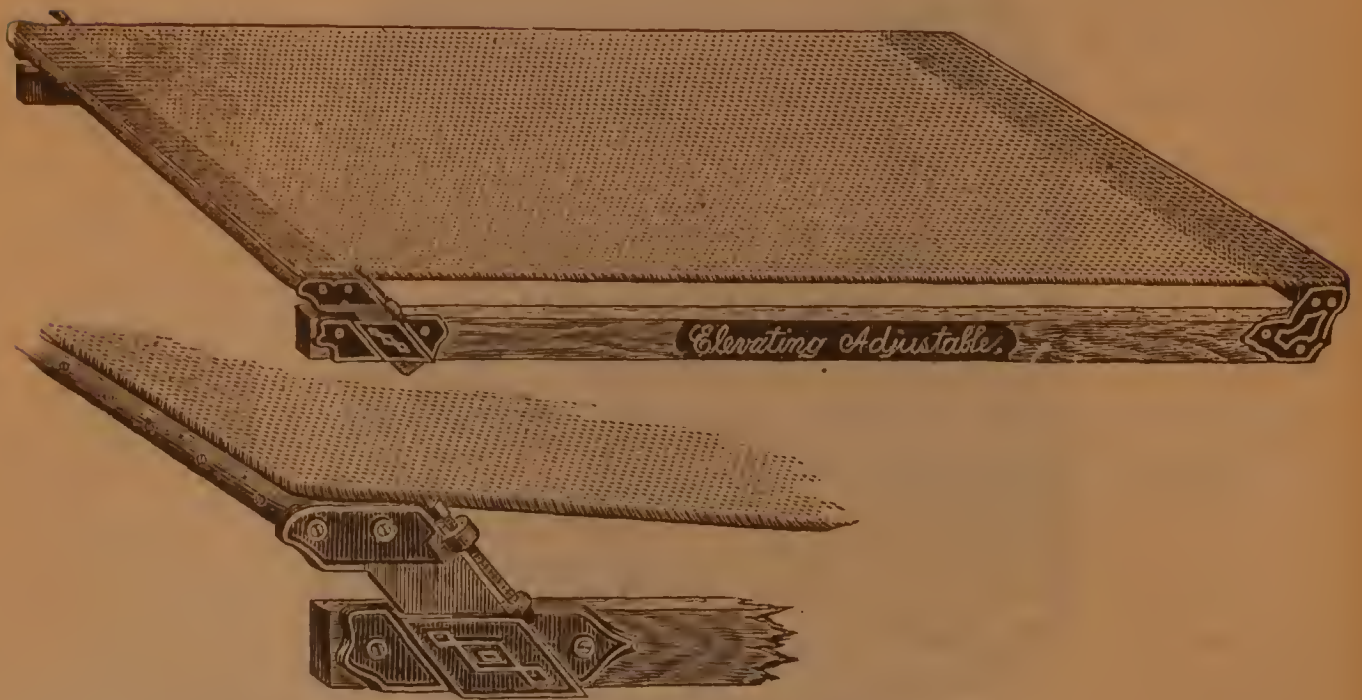
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The statistics of the Belgian merchant navy for 1873, are—

	NO.	TONNAGE.
Sailing vessels,	41	16,434
Steam "	28	30,005
Total,	69	46,439

Belgium is a constitutional, representative, and hereditary monarchy. The legislative power is vested in the King, the Chamber of Representatives, and the Senate. The Chamber of Representatives is composed of deputies chosen directly by all citizens paying a small amount of direct taxes. The number of deputies is fixed according to the population, and cannot exceed one for every 40,000 inhabitants. The Senate is composed of exactly one-half the number of members composing the other chamber, and are elected by the same citizens who appoint the deputies. The public expenditures of Belgium, for 1875, were 238,281,441 francs; receipts during the same year, 243,032,600 francs. The total public debt, in 1875, was 1,127,040,009 francs. The standing army is formed by conscription, to which every able-bodied man, who has completed his nineteenth year, is liable. Substitution is permitted. The actual number of soldiers under arms, on the 1st of January, 1875, was 103,893.

In Belgium the State is a great railway proprietor, and the State railway is one of the largest sources of national revenue. As each conceded railway lapses gratuitously to the State in 90 years from the period of its construction, the entire system will in time become national property. There were, at the end of 1875, 1953 kilometres of railways owned by the State, and 1479 worked by companies; in all 3432 kilometres. (The kilometre = 1093 yards.)

The work of the post office for 1874, was—

Number of offices,	479
Private letters,	58,036,628
Official "	6,035,861
Newspapers,	58,825,598
Packets (printed matter, etc.),	30,094,027

There were, on the 1st of January, 1875, telegraph lines of a length of 4909 kilometres; length of telegraph wires, 20,512 kilometres; telegraph stations, 574.

Elementary education is not yet generally diffused among the people. The schools are supported by the communes, the provinces, and the State combined. Education is not compulsory. In the budget for the year 1874, the sum voted by the Chamber of Representatives for public education amounted to 9,701,628 francs.

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CH. DE SMET-DE SMET, Manufacturer, President of the Industrial and Commercial Society, Vice-President.

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- MR. J. BECO, Engineer.

BELGIUM.

(North of Nave, Columns 54 to 59.)

Minerals, Metallurgical Products.

Minerals, Ores, Stone, Mining Products.

- 1 Bleyberg es Montzen Joint Stock Co., Montzen, Province of Liège.—Zinc and lead ore. 100
- 2 Vincent Sons, Basècles (Hainaut).—Samples of Basècles black marble pavements. 102
- 3 Ville de Spa (Communal Administration).—Trophy furniture, showing views of the city and environs, plans of mineral water-works, samples of these waters, articles of export, etc. The painting of this furniture was executed by Messrs. Boland, Chas., Bronfort, H., Crehey, senior, G. I., Debrus, Alexandre, Debrus, Alexis, Krins, E., Marcette, Henri, and Reigler, L. 107

Metallurgical Products.

- 4 Bonehill Bros., L'Esperance High Furnace Forge Foundry, Marchienne-au-Pont, near Charleroi.—Ornamental iron. 111
- 5 Constant, Emile, Monceau-sur-Sambre, near Charleroi.—Patterns of ornamental iron spring and web iron. 111
- 6 Jowa, Delheid, & Co., Liège.—Rough cast iron patterns, rolled iron, iron wire, corrugated and galvanized sheet iron, bridge platforms, flooring, etc. 111
- 7 Mabilie, Valère, Mariemont (Hainaut).—Manufactured iron, Kind Chaudron shaft-sinking apparatus 111

- *8 Paris, Isaac Joseph, Marchiennes, near Charleroi.—Iron riveted beams for ship-building. 111
- 9 Charleroi Iron Manufacturing Joint Stock Co., Marchienne-au-Pont, near Charleroi.—Iron for building, etc. 111
- 10 Providence Forge Joint Stock Co., Marchienne-au-Pont, near Charleroi.—Iron for building, iron wheels without welding. 111
- 11 Forge and Rolling Mill Joint-stock Co., Régissa, near Huy.—Polished and unpolished sheet iron by wood and coke. 111
- 12 Angleur Steel Manufacturing Co., F. de Rossius, Pastor & Co., Renory, near Liège.—Bessemer cast steel products, rails, tires, axles, forge pieces, and rolled bars. 111
- 13 Jammapes Forge Foundry and Rolling Mill Co., V. Demerbe & Co., Jammapes (Hainaut).—Broken bar-bended iron, tramway rails, system of tramway rails on cast iron sleepers. 111
- 14 Bivort, Raymond, Henri, Arbres, Province of Namur.—Kettles and copper wire. 112
- 15 Bleyberg es Montzen Joint Stock Co., Montzen, near Verviers.—Prepared zinc and lead ore, potters' ore (pure galena) for glazing, pig lead for rolling mill, white lead and crystals, silver ore, block zinc for rolling, galvanizing, etc. 113

NETHERLANDS.—STATISTICAL PREFACE.

THE Kingdom of the Netherlands lies between $50^{\circ} 43'$ and $53^{\circ} 36'$ north latitude and $3^{\circ} 22'$ and $7^{\circ} 16'$ east longitude, is bounded on the north by the North Sea, east by Hanover and the western part of Prussia, south by Belgium, west by the North Sea. Its greatest length, from north to south, is 195 English miles; its greatest breadth from the west, on the North Sea to the extremity of Overijssel, on the east, 110 English miles. It contains 12,637 square miles, including the grand duchy of Luxembourg (which, although possessed of a separate administration, is connected with the kingdom in the person of the sovereign). The entire population, in 1872, was 3,835,111.

The following table gives the population (1872) and area of the provinces, including the reclaimed Haarlem Lake:

	AREA IN SQUARE MILES.	POPULATION.
North Brabant,	1,985	435,262
Gelderland,	1,972	436,029
South Holland,	1,176	700,499
North Holland,	966	591,338
Zeeland,	642	181,532
Utrecht,	531	175,037
Friesland,	1,267	300,257
Overijssel,	1,308	256,681
Groningen,	907	228,883
Drenthe,	1,029	106,713
Limburg,	854	225,352
	<hr/>	<hr/>
	12,637	3,637,583
Grand Duchy of Luxembourg,	990	197,528
	<hr/>	<hr/>
Total,	13,627	3,835,111

The land is generally low, much of it being under the level of the sea, rivers, and canals, especially in North and South Holland, Zeeland, the southern part of Gelderland, and Friesland. Along the west coast the low lands are protected from the sea by a line of sand-hills, or dunes, and where that natural defence is wanting strong dykes have been constructed to keep back the waters, and are maintained at great expense. The greatest of these dykes are those of the Helder and of West Kapell, on the east coast of Walcheren. Engineers, called the officers of the Waterstaat, take special charge of the dykes and national hydraulic works. A hilly district stretches from Prussia through Drenthe, Overijssel, the Veluwe, or Arnhem district of Gelderland, the eastern part of Utrecht, into the Betuwe or country between the Maas and the Waal. This tract has many pretty spots, is of a light sandy soil, well watered, and when not cultivated, is covered with heath or oak-coppice. The greater portion of the north is very fertile, the low lands and drained lakes, called Polders, being adapted for pasturing cattle, and the light soils for cereals and fruits; but in some districts there are sandy heath-clad plains, extensive peat-lands, and undrained morasses, which industry is rapidly bringing under cultivation.

The islands may be divided into two groups, of which the southern, formed by the mouths of the Schelde and Maas, contains Walcheren, South and North Beveland, Schouwen, Duiveland, Tholen, St. Philipsland, Goeree, Voorne, Putten, Beyerland, Ysselmonde Rozenburg, and the island of Dordrecht. The northern group

contains the islands at the entrance of the Zuyder Zee and along the coast of Groningen and Friesland, as Wieringen, Texel, Vlieland, Terschelling, Ameland, Schiermonnikoog, and Rottum. In the Zuyder Zee are Marken, Urk, and Schokland. The chief rivers are the Rhine, Maas, and Scheldt. Important branches of these are the Waal, Lek, Yssel, Roer, etc.

Water ways are more numerous than in any other European country, the immense tracts of meadow-land and the fertile polders being girdled by large canals, and cut in all directions by smaller ones for drainage and communication. Those of most importance to the national trade are, the North Holland canal, constructed 1819-1825, to connect the port of Amsterdam with the North Sea; the Voorne canal, from the north side of Voorne to Hellevoetsluis, which shortens the outlet from Rotterdam; the South Willemsvaart, through North Brabant, Dutch and Belgian Limburg, from Hertogenbosch to Maastricht, being $71\frac{1}{2}$ English miles in length, and having 24 locks. Besides these, there are numerous important canals, connecting rivers, and cutting the kingdom into a network of water-courses. To improve the entrances to the Maas, the Hock, of Holland, has lately been cut. The new canal through the Y will be nowhere less than 80 yards broad, with sluices nearly 400 feet in length, and a depth of nearly 23 feet. It will reduce the distance from Amsterdam to the sea to about 15 miles, and gives a safe way for large ships.

The climate of the Netherlands is variable, chilly colds often closely succeeding high temperatures, inducing various forms of fever and ague, and requiring peculiar care as to clothing, etc. In summer, the thermometer sometimes rises above 80° , and even to 90° F. in the shade, and a winter of great severity usually occurs every fifth year, when carriages and heavily laden wagons cross the rivers and the Y on the ice, and thousands enjoy the national pastime of skating.

The farms are generally small and well cultivated. The leading agricultural products of Zeeland are wheat and madder; in South Holland, madder, hemp, butter, and cheese; in North Holland, butter and cheese are extensively made, and cattle, sheep, and pigs reared and exported. The horses of Friesland, Zeeland, and Gelderland are of first-rate quality. The exportation of butter from Holland and Friesland, and of Edam, Leyden, Gonda, and Frisian cheese, is quite large. Fruit is abundant, and in several provinces, as Gelderland, Utrecht, and Drenthe, much attention is paid to bees. In Haarlem and neighborhood, tulips and hyacinths are much cultivated, realizing a large annual amount. Wild ducks, snipes, plovers, and hares are plentiful; and there are also conies, partridges, pheasants, and deer—game forming an article of export.

The Netherlands are of recent formation, and consist of an alluvial deposit, chiefly of a deep, rich clayey soil, superimposed on banks of sand, marine shells, and beds of peat and clay. It appears that at some distant period there has been a depression of the land below its former level, enabling the sea to burst through its sand-banks, submerge the land, and form new deposits. The higher districts are composed of sand-drift mingled with fertile earths, and resting on a bed of clay. Coal is worked in Limburg; and a soft sandstone, which becomes fit for building purposes after having been some time exposed to the atmosphere, is quarried in the southern part of that province, which has also pipe and other clays. Valuable clays for pottery, tile, and brick making, abound in the various provinces.

The chief manufactures are linen, woolen, cotton, and silk fabrics; paper, leather, glass, etc. Leyden and Tilburg are famed for woolen blankets, wool-dyed pilot, fine cloths, and friezes; Hertogenbosch for linens and rich damasks; calicoes, shirtings, drills, tablecloths, striped dimities are made at Almelo, Amersfort, and in the leading towns of Overijssel. Good imitation Smyrna and Scotch carpets, and carpets of hair and wool, are manufactured at Deventer, Delft, Arnhem, Hilversum, Utrecht, and Breda; Turkey-red yarns, dyed silks, and silk stuffs at Roermond, Utrecht, Haarlem, etc.; leather, glass, firearms, at Maastricht and Delft; iron-founding, rolling and hammering of lead and copper, cannon-founding are carried

on at the Hague, etc.; and powder-mills at Muiden; Oudenkerk, Middelburg, Hertogenbosch, Amsterdam, Nymegen, etc., have important breweries. Waalwyk, Heusden, and surrounding districts, manufacture boots and shoes, of which Heusden sends to North and South Holland 1,000,000 pairs annually. Gin is distilled at Schiedam, Delft, Rotterdam, and Weesp. Amsterdam has the largest diamond-cutting trade in the world, 10,000 persons depending on that branch of industry. Sugar refining is largely carried on at Amsterdam, Rotterdam, and Dordrecht, from all of which sugar is exported to Russia, the Levant, and countries of Europe. Paper is chiefly made in Holland and Gelderland. The leading letter-type foundries are at Amsterdam and Haarlem. Manufactures of every kind are being rapidly increased in number, and adding to the material prosperity of the Netherlands. The chief motive power is the windmill, which forms a never-failing element in the scenery; but of late years steam is becoming more general.

Fishing, not only in the inland waters, the coasts and bays of the North Sea, but also on the coast of Scotland, is vigorously pursued. In 1872 the total value of the herrings taken in the North Sea was about \$450,000, 108 vessels having been employed; on the Netherland coasts, to the value of about \$250,000, and in the Zuyder Zee, additional, 18,052,000 herrings were taken. The anchovy take, almost exclusively in the Zuyder Zee, amounted to 9000 anker, valued at about \$90,000. There are productive oyster beds, besides extensive fishings of cod, ling, turbot, flounders, soles, shrimps, haddock, etc.; and from the rivers, salmon, eels, perch, etc.

The foreign commerce of the Netherlands, during the year 1873, was as follows:

	IMPORTS. IN GUILDERS.	EXPORTS. IN GUILDERS.*
Europe,	533,390,000	459,799,000
America,	39,838,000	8,125,000
Asia,	23,207,000	435,000
Africa,	2,747,000	890,000
Other countries,	298,000	1,000
	<hr/> 599,480,000	<hr/> 469,250,000

COLONIAL POSSESSIONS.

Java,	82,485,000	45,083,000
West Indies,	119,000	302,000
	<hr/> 682,084,000	<hr/> 514,635,000

The Guinea coast is not included in the above, the statistics for 1873 not being at command. During 1872, the imports 26,000, the exports 137,000 guilders. At the end of 1874 the merchant navy numbered 1827 vessels of 511,982 tons.

The constitution vests the whole legislative authority in a parliament composed of two chambers, called the States-General. The Upper House, or First Chamber, consists of 39 members, elected by the provincial states, from among the most highly assessed inhabitants of the various counties. The Second Chamber of the States-General, elected by ballot, at the rate of one deputy to every 45,000 souls, numbered 80 members in 1875. All citizens, natives of the Netherlands, not deprived of civil rights, and paying assessed taxes to the amount of not less than 20 guilders, are voters. Clergymen, judges of the High Court of Justice, and governors of provinces, are debarred from being elected. Every two years one-half the members of the Second Chamber, and every three years one-third of the members of the Upper House, retire by rotation. The Second Chamber has the initiative of new laws, and the functions of the Upper House are restricted to either approving or rejecting them, without the right of inserting amendments. The king has full veto power, but it is rarely, if ever, exercised. The executive authority is, under the

* The guilder equals 40 cents gold.

sovereign, exercised by a responsible council of ministers. The budget estimates for the year 1874, were as follows: Total revenue, 93,742,144 guilders; total expenditure, 93,742,144; estimated deficit, 6,244,740 guilders. The financial estimates are always framed with great moderation, generally showing a deficit, which, in the final account, becomes a surplus. There is a separate budget for the great colonial possessions in the East Indies. The Netherlands East India estimates, for 1874, are thus summarized:

	GUILDERS.
Revenue from receipts in the Netherlands,	48,958,967
“ “ “ in India,	74,639,232
	<hr/>
	123,598,199
	<hr/>
Expenditure in the Netherlands,	17,956,922
“ “ India,	95,096,698
	<hr/>
	113,053,620
Contribution in aid of the Home Government, for 1874, . .	10,544,579
	<hr/>
	123,598,199

At the commencement of the year 1874, the national debt was represented by a capital of 927,320,076 guilders. The regular army stationed in the Netherlands comprised, on the 1st of July, 1875, 1935 officers and 59,491 men. The colonial army, on the 1st of January, 1875, comprised 27,475 men, 12,310 of whom were Europeans, and 15,165 natives. The navy, on the 1st of July, 1875, consisted of 88 steamers, carrying 474 guns, and 27 sailing vessels, with 195 guns. At the beginning of the year 1875, there were 1668 kilometres of railway opened for traffic. Of these, 853 belonged to private companies and 815 to the State. The number of post offices at the commencement of 1875 was 1241; the number of letters carried during the year, 44,396,330. The length of telegraph lines, January 1st, 1875, was 3431 kilometres; the length of wires, 12,365 kilometres; the number of offices, 328. During the year 1874 the number of telegrams carried was 2,084,121. Under the working of the primary instruction law, there were, in January, 1871, according to government returns, 2608 public schools, with 6538 schoolmasters and 477 schoolmistresses, and 1119 private schools with 2332 schoolmasters and 1565 schoolmistresses. At the same date the pupils in the public schools numbered 390,129, and the pupils in the private schools, 111,762. There were, also, in 1871, 81 schools of middle instruction, with 7047 pupils, and 55 Latin schools, with 1128 pupils. There are three universities, Leyden, Groningen, and Utrecht, with 1339 students in January, 1871, and a polytechnic institution, at Delft, with 171 pupils.

COLONIES.

The colonial possessions of the Netherlands embrace an area of 666,756 English square miles. The total population, according to the last returns, was 24,386,991.

The East Indian island of Java, possessing, with the adjoining Madura, an area of 51,336 English square miles, and a population, at the end of 1872, of 17,298,200, is by far the most important of the colonial possessions of the Netherlands. The whole of the other Netherlands possessions in the East Indies are administered as dependencies of Java.

Almost the entire trade of Java and Madura is with the Netherlands, and there is comparatively little commercial intercourse with other countries. The total imports, including specie, for 1873, were 108,304,000 guilders; total exports, including specie, 155,881,000 guilders. The principal articles of export from Java are sugar, coffee, rice, indigo, and tobacco. The imports of the other East Indian possessions, during 1873, were 42,486,000 guilders; the exports, 41,869,000 guilders.

The Dutch West India Islands, of which Curacoa is the most important, have a total population of 36,160, and an area of about 400 square miles. Surinam, with an area of about 45,000 square miles has a population of 69,834.

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- 1 Lent, W., Schooten.—Iron and cinabar. 100
- 2 Seirat, C. H. A., Utrecht.—Peat pressed by machinery. 101
- 3 Onduwat, H. F., Dordrecht.—Stones for pavement. 102

4 Van Verschuur & Van der Voort, Amsterdam.—Unpolished stones. 102

5 Borst & Roggenkamp, Delfzyt.—Portland cement stones, lithographic stones, oilstones, whetstones, grindstones, polishing material, and sand quartz; garnets, raw topazes, diamonds, tripoli, and corundum. 106

SWEDEN.—STATISTICAL PREFACE.

SWEDEN and Norway (Sverige and Norge), two independent kingdoms, but under a common king, form the Scandinavian peninsula, whose shores are washed by the waters of the Gulf of Bothnia, the Baltic, the Sound, the Kattegat, the Skager-Rack, the North Sea, the Atlantic and Arctic Oceans, and is thus completely separated from the mainland, with the exception of its northeastern part. The length of its coast, which is indented with numerous bays and fiords, and protected from the brunt of the sea by innumerable islands and rocks, may be estimated at about 3200 English miles, each kingdom possessing about one-half. The Scandinavian peninsula, of which Sweden forms the eastern and southern part (58 per cent.), while Norway makes up the rest (42 per cent.), embraces an area of 13,830 geographical square miles (294,000 English square miles). The united kingdoms have a population of rather more than six millions, of which 70 per cent. belong to Sweden, and 30 per cent. to Norway. The statistics of Norway are given elsewhere in this catalogue.

Although Sweden extends northward to latitude $69^{\circ} 3' 21.1''$, thus passing beyond the Arctic circle, it reaches southward to latitude $55^{\circ} 20' 18''$, coming within the latitude of its neighboring state, Denmark, and even further south than that part of Prussia which projects northward along the eastern shore of the Baltic. The total length of Sweden, from north to south, is about 950 English miles, and the width from 200 to 250 English miles. The observatory of Sockholm lies $18^{\circ} 3' 29.85''$ east of Greenwich.

The läns (governments or departments) are the largest administrative divisions of the country, and frequently have two names, one of which is derived from the seat of government, the other usually from the old division of the provinces. The geographic division of the kingdom into three parts stands in intimate relation with the old provincial division. The three geographical divisions are as follows: Svealand (the central), Götaland (the southern), and Norrland (the northern); and though the boundaries of the läns and the provinces do not quite correspond, the following may on the whole be stated as correct:

Svealand has six provinces: Uppland, Södermanland, Westmanland, Nerike, Vermland, and Dalecarlia (or Dalarne).

Görland has nine provinces: Ostergötland, Westergötland, Dalsland, Smäland, Gottland, Blekinge, Scania or Skåne, Halland, and Bohuslaw.

Norrland comprises Gestrückland, Helsingland, Medelpad, Angermanland, Jemtland, Herjedalen, and Westerböton, together with Lapland.

Lapland, the most northern part of Sweden, bordering on Norway, has an area of about 40,000 English square miles, and, together with Norrland, forms more than one-half the whole area. This vast territory is, of all the Swedish provinces, the least adapted to agriculture, and is but sparsely populated.

In 1874, the population of Sweden was divided among the different läns, as follows:

NAMES.	POPULATION.	NAMES.	POPULATION.
The town of Stockholm,	150,446	Län of Elfsborg,	285,217
Län of Stockholm,	134,620	" Skaraborg,	250,257
" Uppsala,	103,282	" Vermland,	266,362
" Södermanland,	139,216	" Orebro,	177,084
" Ostergötland,	262,872	" Westmanland,	121,018
" Jönköping,	186,841	" Kopparberg,	184,330
" Kronoberg,	163,793	" Gefleborg,	160,487
" Kalmar,	238,399	" Westernorrland,	147,212
" Gottland,	54,499	" Jemtland,	74,758
" Blekinje,	130,921	" Westerbotten,	96,607
" Kristianstad,	228,498	" Norrbotten,	81,987
" Malmöhus,	330,115		
" Halland,	130,802		
" Göteb, and Bohus,	241,936	Total,	4,341,559

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Sweden is generally less mountainous than Norway, and the highest mountains are found just on the border of that country. The boundary line itself is supposed to run along a mountain chain, which is called by geographers the Kölen, though in reality there is no mountain of that name. The highest mountain in Sweden, Sulitelma (6315 Swedish feet above the level of the sea), lies in Lapland, and is the only alpine elevation in Sweden where, as far as is known, glaciers are found, but there are other mountains in these districts, and still further south along the frontier of the kingdom, in Jemtland and Herjedalen, with an elevation of from 4000 to 5000 feet, whose peaks are dotted with patches of snow the whole year round.

About eight per cent. of the area of Sweden is considered to lie upwards of 2000 feet above the level of the sea. Those parts which sometimes extend beyond the tree-line are exclusively in Norrland and Dalarne, and border upon Norway. The coast-line along the Gulf of Bothnia, and the whole of the central and southern parts of Sweden, lie, with few exceptions, lower than 800 feet above the level of the sea. Of the whole area of the kingdom, a third part does not lie 300 feet above the level of the sea, and it is within these lower lying districts that the most highly cultivated parts of the country are found, as well as the largest plains, such as the Uppland, the Ostgöta, the Westgöta, and the Skane plains. With the exception of these, the plains are neither numerous nor large, for, though there are extensive tracts of land which attain a height of only a few hundred feet above the level of the sea, these are generally intersected by numerous hills and valleys.

Sweden, next to Finland, is the best irrigated country in Europe, as her lakes and rivers cover an area of 14,428 English square miles, or 8.4 per cent. of her whole territory, while she has a sea coast of 1500 English miles. The water of the Swedish lakes, as well as that of the rivers, is generally clear and drinkable. Lake Wetter is especially known for its clear, but at the same time turbulent, body of water, as well as for its great depth—420 feet. Of the numerous rivers (or elfs) which flow into the Gulf of Bothnia, the Angerman elf is the best known, not only for its volume, but for its natural beauty. The Dal elf, which is usually considered as the dividing line between Norrland and the southern part of Sweden, empties further to the south. On the west coast flows the Göta elf, the outlet of Lake Wener, famed for the Trollhätta waterfall.

Almost every river or stream forms a foaming current or roaring cataracts, and there are thousands of them. Even the Trollhätta finds a rival in the Njommelsaska (Hare's Leap), in Lapland. One of the peculiarities of these lakes is that they are sometimes interrupted by an almost perpendicular fall—the water then spreading out, forming a second part of the lake. The nation possesses in these numerous falls an almost inexhaustible water power, which has not, as yet, been utilized to that extent which it might be. This character of the Swedish rivers carries with it, however, the disadvantage of rendering them innavigable, many of the rivers (the Dal elf, for instance) being barred at their very mouths by a fall; and, as a rule, they are navigable only for a mile or two, except for rafts and small boats, unless, as in the case of the Göta elf, they are provided with canals.

The climate of Sweden is mild in comparison to its high latitude, a fact which is attributed to the influence of the Gulf Stream. There are dense forests; and barley and rye mature in the province of Norrland, while its most southern part lies in the same latitude as the ice fields of Greenland, and its northern in that of barren Iceland. The country, extending through so many degrees of latitude, has a great variety of climate. The mean yearly temperature of the northern parts along the coast is 34° F., while that of the southern is 44° to 46° F. The mean yearly temperature of Stockholm is 41° F. The wells which serve as a measure of the earth's temperature, give about the same figures, the average temperature of a deep well in central Sweden being 43° F., while it is not unusual in Lapland to find a deep well covered with ice in midsummer, or a bog, 5 to 6 feet deep, frozen at its bottom; nevertheless,

the cereals and potatoes mature in these districts, for although the summer is short, it is very warm and clear. There can scarcely be said to be any night here during the summer, only a twilight, so that vegetation, even in this high latitude, receives the light and heat necessary for its ripening. The temperature of the southern parts is also subject to very great changes.

The farmers' worst enemy in Sweden is the frost, which in a single clear night, perhaps, after a warm summer day, will destroy his brightest prospects; but it is hoped that the increase of tillage, the draining of the bogs, and like causes, will at least mitigate its severity, if not altogether prevent it. Such severe frosts are very rare in the central and southern parts of Sweden.

(The greater portion of the foregoing was furnished by the Swedish commission.)

Mining is one of the most important departments of Swedish industry, and the working of the iron mines in particular is making constant progress by the introduction of new machinery. There were raised, in the year 1873, 19,458,339 hundredweight of iron ore from mines, besides 126,147 hundredweight from lake and bog. The pig iron produced amounted to 7,987,646 hundredweight, the cast goods to 501,350 hundredweight, the bar iron to 4,125,915 hundredweight, and the steel to 1,290,907 hundredweight. There were also raised, in the same year, 1660 pounds of silver, 26,152 hundredweight of copper, and 645,631 hundredweight of zinc ore. There are large veins of coal in various parts of Sweden, but no systematic working of them has as yet taken place.

The principal articles of cultivation are, in addition to the various cereals, potatoes, hemp, flax, tobacco, and hops, which are generally grown in sufficient quantities for home consumption. The forests are of great extent, covering nearly one-fourth of the whole surface, and, in some spots, rising to an elevation of 3000 feet above the level of the sea. The birch, fir, pine, and beech are of great importance, not only for the timber, tar, and pitch which they yield, but also for their supplying charcoal and firewood. The common fruit trees, as cherries, apples, and pears, grow as far north as 60°, but the fruit seldom comes to great perfection except in the southern provinces; cranberries and other berries abound in all parts of the country.

In 1870, there were in Sweden, 428,446 horses, 1,965,800 horned cattle, 1,780,000 sheep and goats, and 354,303 swine.

In 1873, there were 2549 factories, with a production valued at 146,869,000 crowns.* Mines and mining establishments are not included in these figures. Ship building forms an extensive branch of industry.

According to the "Statesman's Year Book for 1876," the commercial navy of Sweden, at the end of 1873, numbered 1865 registered vessels for foreign trade, of a total burthen of 366,370 tons. The total imports, for the same year, were 271,440,000 riksdalers,† and the exports, 221,904,000.

Sweden is a constitutional monarchy, based on the fundamental law of 1809, by which it was decreed that the succession should be in the male line; that the sovereign should profess the Lutheran faith, and have sworn fidelity to the laws. The diet, which meets every year, and remains sitting for three or four months, is composed of two chambers, which are both elected by the people. The members of the first chamber serve for nine years, and those of the second for three. The diet exercises a strict control over the expenditure of the revenue, fixes the budget, and has power to take cognizance of the acts of the ministers and crown officers. The king's person is inviolable, and he can exercise a veto on the decrees of the diet. He is assisted by a Council of State, composed of ten members, who are responsible to the diet.

The budget estimates for 1875 place the receipts at 64,775,900, and the expenditures at 71,885,798 riksdalers. At the end of October, 1875, the public liabilities of the kingdom were 130,477,920 riksdalers.

* The Swedish crown equals 26.8 cents.

† One riksdaler equals one crown.

The total strength of the armed forces of Sweden, at the end of September, 1875, was 132,775. The navy consists of 131 vessels, of 3183 horse-power, carrying 394 guns, and with crews aggregating 4693.

At the end of September, 1875, the total length of railways opened for traffic was 2237 English miles, of which 938 miles belonged to the State. All the telegraphs, with the exception of those of private railway companies, belong to the State. The total length of telegraph lines, at the end of 1874, was 4981 English miles; the total length of wires, 10,980 English miles. The total number of dispatches sent, in the year 1874, was 986,397.

The Swedish post office carried 16,711,100 letters in the year 1873. The number of post offices, at the end of the year, was 641.

Education is well advanced in Sweden. Public instruction is gratuitous and compulsory, and children not attending schools under the supervision of the government must furnish proofs of having been privately educated. In the year 1871 nearly 97 per cent. of all the children between eight and fifteen years visited the public schools.

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SWEDEN.

(North of Nave, Columns 6 to 11.)

Minerals, Ores, Stone, Metallurgical Products.

Minerals, Ores, Stone, Mining Products.

- 1 Adelsvärd, Baron, Th., Atvidaberg.
—Copper ore. 100
- 2 Bofors Stock Co., Gullspang, Bofors.
—Iron ores. 100
- 3 Berg, Axel, Warby, Stockholm.—
Iron ores. 100
- 4 Berg, Gottfried, Warby, Stockholm.
—Zinc, galena, and nickel ores, pyrites. 100
- 5 Fagersta Stock Co., Westanfors.—
Iron ores. 100

COLLECTIVE EXHIBIT OF IRON MANUFACTURERS, STOCKHOLM.

- 6 Avesta Garpenbergs Stock Co.,
Avesta.—Iron ores. 100
- 7 Björneborgs Stock Co., Björneberg.
—Iron ores. 100
- 8 Degerfors Stock Co., Degerfors in
Wernland.—Iron ores. 100
- 9 Ekman, Carl, Finspong.—Iron
ores. 100
- 10 Gysinge Iron Works, Gysinge.—
Iron ores. 100
- 11 Hermansson, Count C. F. von,
Ferna, Bernshammar.—Iron ores. 100
- 12 Hofors & Hammarby, Hammarby,
Storvik, Gefle.—Iron ores. 100
- 13 Larsbo Norns Stock Co., Kafalla.—
Iron ores. 100
- 14 Laxa Stock Co., Laxa.
a Iron ores. 100
b Pig iron, blooms, and iron bar. 111
- 15 Lesjöfors Stock Co., Filipstad.—Iron
ores. 100
- 16 Lindberg, Lars, Kohlsva.—Iron
ores. 100
- 17 Löfvenskiöld, Salomon, Nissafors,
Jönköping.—Iron ores. 100
- 18 Ramnäs Stock Co., Ramnäs.
a Iron ores. 100
b Pig, bar iron, and slag. 111
- 19 Rettig, C. A., Kilafor, Söderhamn.
—Iron ores. 100
- 20 Schisshyttan Molnebo Manufactur-
ing Co., Morgongäfva.
a Iron ores. 100
b Spiegeleisen. 111
- 21 Stockenström, Axel von, Akers
Manufacturing Co., Mariefred.—Iron
ores. 100
- 22 Kopyrarbergs Factory, Stockholm.
—Iron ores. 100
- 23 Sundström, J. O., Charlottenberg.—
Iron ores. 100

- 24 New Gellivara Company (limited),
Lulea.—Iron ores. 100
- 25 Osterby & Strömbacka, Osterby.—
Iron ores. 100
- 26 Uddeholms Stock Co., Rada.—Iron
ores. 100
- 27 Wedberg, C. H., Hammarby, Jerla.
—Iron ores. 100
- 28 Nordenskiöld, A. E., Stockholm.—
Meteorite from Greenland. 100
- 29 Sandvikens Stock Co., Sandviken.—
Iron ores. 100
- 30 Schough, Robert, Lulea.—Iron ores,
copper ores. 100
- 31 Geological Society of Sweden, Stock-
holm.—Geological collections. 100
- 32 Höganäs Coal Works, Höganäs.—
Mineral coal. 101
- 33 Samuelson, S. H., Föskefors, Rada.
—Peat. 101
- 34 Westerlund, A. F., Nybro, Kalmar.
—Peat. 101
- 35 Berg, Gottfried, Wärby, Stockholm.
—Porphyry, serpentine, and marble. 102
- 36 Klintberg, J. W., Wisby.—Marble,
petrifications. 102
- 37 Kullgrens', C. A., Widow, Uddevalla.
—Polished granite. 102
- 38 New Marble Works Stock Co., Norr-
köping.—Manufactured marble. 102
- 39 Skaanska Cement Stock Co., Malmö.
—Portland cement, raw materials and
products. 103
- 40 Rörstrands Stock Co., Stockholm.
—Feldspar. 104
- 41 Höganäs Coal Works, Höganäs.—
Fire clay, fire brick. 104
- 42 Berg, Gottfried, Warby, Stockholm.
a Graphite. 105
b Grindstones. 106
c Vivianite. 107
- 43 Berg, Chr. Lud., Eriksberg, Stock-
holm.—Mineral waters. 107
- 44 Mineral Water Stock Co., Stock-
holm.—Mineral waters. 107

Metallurgical Products.

- 45 Bofors Stock Co., Gullsprang, Bofors.
—Pig iron, blooms, bar iron, wire rods, and
iron plate. 111
- 46 Fagersta Stock Co., Westanfors.—
Pig iron, Bessemer steel ingots, bars,
plates, etc.; steel samples, showing the
strength of the steel. 111

Metallurgical Products.

- 47 Göteborgs Mechanical Works Stock Co., Göteborg.—Crown of a flue. 111
- COLLECTIVE EXHIBIT OF IRON MANUFACTURERS, STOCKHOLM.**
- 48 Ankarsrums Works, Ankarsrum.—Pig iron, blooms, iron bars, wire rods, and railway crossings. 111
- 49 Avesta Garpenbergs Stock Co., Avesta.—Pig iron, blooms, and bar iron. 111
- 50 Björneborgs Factories, Björneborg.—Pig iron, Bessemer steel ingots, and manufactured Bessemer steel. 111
- 51 Degerfors Stock Co., Degerfors, Wermland.—Pig iron, blooms, wire rods, and plate. 111
- 52 Ekman, Carl, Finspong.—Pig iron for guns, and malleable blooms, and bar iron. 111
- 53 Gysinge Iron Works, Gysinge.—Iron in the pig and bars, with specimens of slag. 111
- 54 Von Hermansson, C. F., Count, Ferna, Bernshammar. Pig iron, spiegel-eisen, and bar iron. 111
- 55 Hofors & Hammarby, Hammarby, Storvik, Gefle.—Pig iron, blooms, and bars, with specimens of slag. 111
- 56 Larsbo, Norns, Stock Co., Kafalla.—Pig iron, blooms, bar iron, and angle iron. 111
- 57 Lesjöfors Stock Co., Filipstad.—Pig iron, ingots of Bessemer and Martin steel, bars, wires, and wire rope of the same material. 111
- 58 Lindberg Lars, Kohlsva.—Pig iron, bar iron, and wire rods. 111
- 59 Löfvenskiöld, Salomon, Nissafors, Jönköping.—Iron in the pig and bars. 111
- 60 Rettig, C. A., Kilafors, Söderhamn.—Pig and bar iron. 111
- 61 Von Stockenström, Axel, Mariefred.—Pig iron for malleable iron. 111
- 62 Bergslag Iron Works, Stockholm.—Pig iron, Bessemer ingots, blooms, bar iron, and samples of iron showing the quality. 111
- 63 Sundström, J. O., Charlottenberg.—Pig iron, bar iron, and spikes. 111
- 64 New Gellivara Company (limited), Lulea.—Pig iron, bar iron, and nails. 111
- 65 Asterby & Strömbacca, Osterby.—Pig iron, Bessemer steel ingots and bars, blister steel, crucible cast steel, and bar iron. 111
- 66 Surahammars Stock Co., Surahammar.—Iron plate, puddled iron, and steel bars, railway wagon wheels and axles. 111
- 67 Uddeholms Stock Co., Rada.—Pig iron, ingots of Bessemer and Martin steel, and iron in bars, springs. 111
- 68 Larsson, P. M., Löa, Rällsa.—Samples of pig iron. 111
- 69 Motala Mekaniska Stock Co., Motala.—Iron and steel in bars, plates, and sheets, with products of working. 111
- 70 Sandvikens Iron Works, Sandviken.—Pig iron, Bessemer steel ingots, forgings for engines, steamers, etc. 111
- 72 Adelswärd, Th., Baron, Atvidaberg.—Copper in ingots, with specimens illustrating its various stages of production. 112
- 73 Skultuna Stock Co., Westeras.
a Copper, with products of working. 112
b Brass in different stages of production. 114
(For rails, railway and wagon wheels, tires, axles, etc., see Class 573, Machinery Hall.)

NORWAY.—STATISTICAL PREFACE.

NORWAY, the western portion of the Scandinavian peninsula, is situated between $57^{\circ} 58'$ and $71^{\circ} 10'$ north latitude, and between 5° and 28° east longitude. It is bounded to the east by Sweden and Russia, and on every other side is surrounded by water, having the Skagerrak to the south, the German Ocean to the west, and the Arctic Sea to the north. Its length is about 1100 miles, and its greatest width about 250 miles; but between the latitudes of 67° and 68° it measures little more than 25 miles in breadth. The area is given as 121,779 square miles, and the population as 1,800,000. Only 1.6 per cent. of the whole area can be cultivated; natural pastures occupy about 1.5 per cent; forests, about 20.2 per cent.; mountains, glaciers, lakes, rivers, and land, etc., about 76.7 per cent. The whole of the Scandinavian peninsula consists of a connected mountain mass, which, in the southern and western parts of Norway, constitutes one continuous tract of rocky highlands, with steep declivities dipping into the sea, and only here and there broken by narrow tracts of arable land. South of Trondjem (63° north latitude) the rocky ridge expands nearly the entire breadth of Norway. The northern portions of the range, known as the Kiöllen

Fielle, occupy a space of about 25 miles in width, and form, as far north as 69° , the boundary line between Sweden and Norway. South of 63° north latitude the range of the Scandinavian mountains is known as the Norske, or Dovre Fielle, although the latter name belongs properly only to the part immediately in contact with the Kiöllen. This range, about 360 miles in length, attains its greatest elevation at the Sogne Fjord, where it is known as the Hurungerne. Here the highest summits are 8000 and 8400 feet above the sea, while the contiguous snowfields of Justedal, the largest in Europe, and covering an area of 600 square miles, have probably an elevation of nearly 7000 feet. From these and other vast snowfields, averaging more than 10 miles in width, vast glaciers descend to within 2000 feet above the sea, where they often terminate in deep lakes, some of which are very extensive. The upper valleys of this range, although generally too high for cultivation, contain the best timber that is exported from Norway, and afford good pasturage in the height of the summer, when the flocks and herds are driven thither from the lowlands near the entrance of the fjords. The general elevation of the Norska Fielle does not rise above the line of perpetual snow, whose average height in these latitudes is 5000 feet, but it ranges above that of the growth of trees, which may be stated to lie 1000 feet lower. The most northern part of the Norska Fielle, which is known as the Dovrefield, and includes Sneehätten, nearly 7500 feet above the sea, presents a broken surface, rent with ravines and narrow valleys, which admit of cultivation, but are difficult of access from the configuration of the land around them.

The Scandinavian range consists principally of primitive and transition rock, and exhibits almost everywhere the effect of glacial action, the glaciers and moraines presenting the same appearances as in the Swiss alpine district. The numerous islands which skirt the coast of Norway, and must be regarded as portions of the range, present the same characters as the continental mass. Some of these, as the islands of Alsten and Dunnoe, rise perpendicularly from the sea with peaks penetrating beyond the snowline, which lies here at an elevation of 4000 feet. Norway abounds in lakes and streams; according to some topographers, there are upwards of 30,000 of the former, of which the majority are small, while none have an area exceeding 400 square miles. The chief rivers of Norway are the Glommen, Lougen, Louven, Drammen, Otter, and Wormen. The first of these has a course of 400 miles, but the majority of the Norwegian streams, all of which rise at great elevations, have a comparatively short course, and are unfit for navigation, although they are extensively used to float down timber to the fjords, whence the wood is exported in native ships to foreign ports. These fjords, or inlets of the sea, which form so characteristic a feature of Norwegian scenery, and give with their various sinuosities a coast-line of upwards of 8000 miles, form the outlet to numerous rapid streams and waterfalls, which leap or trickle down the edges of the treeless fields or mountain flats above.

The peculiar physical character of Norway necessarily gives rise to great varieties of climate in different parts of the country. The influence of the sea and of the Gulf Stream, and the penetration into the interior of deep inlets, greatly modify the severity of the climate on the western shores, and render it far superior to that of the other Scandinavian countries in the same latitude. In Norway proper, the winters, as a rule, are long and cold, and the summers, which rapidly follow the melting of the snows in April and May, are warm and pleasant. On the islands, however, the heats of summer are often insufficient to ripen corn.

Norway had, in 1875, 150,000 horses, 950,000 oxen and cows, 1,710,000 sheep and goats, 110,000 pigs, and 102,000 reindeer. The value of the annual product is about \$25,000,000.

The principal cereals cultivated in Norway are oats, barley, corn, rye, and wheat; the yearly produce is about 11,160,000 bushels, besides 14,100,000 bushels of potatoes. The value of the harvest amounts to about \$16,000,000 per annum.

The products of agriculture and cattle-breeding being insufficient to supply the wants of the country, considerable quantities are imported.

Forestry is of great importance. As stated above, the forests of Norway cover more than one-fifth of its entire area. They supply considerable quantities of timber, both for home consumption and exportation. The average annual exports of timber amount to about \$16,000,000.

The fisheries of Norway employ about 27,000 men, and yield about \$16,000,000 per annum. They are of great importance, and not only yield one of the most important articles of home consumption, but at the same time constitute one of the most profitable sources of foreign export. Fish are caught in almost every stream and lake of the interior, as well as in the fjords of the coast, and in the bays and channels which encircle the numerous islands skirting the long sea-line of Norway. These fish are principally cod and herring. Cod, prepared as stock-fish or dried salt fish, is exported to Spain and Italy; herring to the Baltic ports.

The merchant marine of Norway had, in 1875, a tonnage of 1,220,000, and was manned by 53,000 seamen.

The following statistics apply to the exports and imports of Norway in 1873:

Value of goods exported,	\$33,000,000	
Gross freight of goods carried in Norwegian vessels,	28,400,000	
Receipts from various sources,	800,000	
		\$62,200,000
Value of goods imported,	\$45,800,000	
Expenses of Norwegian vessels in foreign countries,	11,400,000	
Other expenses,	2,400,000	
		59,600,000
Balance,		\$2,600,000

The principal articles of export were, in 1873: Products of the fisheries, \$11,600,000; of forestry, \$15,500,000; of agriculture and cattle-breeding, \$1,300,000; metals and minerals, \$1,800,000; textile fabrics, \$660,000.

The imports were principally: Articles of food, \$13,500,000; coffee, \$3,500,000; liquors, \$1,000,000; textile fabrics and dry goods, \$8,300,000; hardware, \$3,300,000; hides, \$1,200,000; coal, \$1,700,000; vessels, \$1,400,000.

Manufactures have made some progress during the last few years, but are, as yet, inconsiderable. About 32,000 persons are employed, mainly in sawmills, planing mills, brick factories, shipbuilding, and metallurgical and textile industries.

The mineral products comprise silver, copper, cobalt, iron, chrome, ironstone, etc., and yield an annual income of nearly \$1,000,000.

Education is compulsory, parents being bound to let their children, between the ages of seven and fourteen, receive public instruction; 241,000 children attend the common schools, and 16,500 receive a higher instruction. The expenses of the higher schools were, in 1873, \$827,000.

The public revenue, in 1873, was \$6,870,000, and the expenditures \$7,277,000, of which amount \$865,000 was for the construction of railways. The public debt amounts to \$9,200,000.

Norway has 12,132 miles of highways and district roads, 304 miles of railways, and 147 miles of canals. There are 719 post offices, which distribute 7,500,000 letters per annum.

(The foregoing statistics are furnished by the Norwegian Commission.)

According to "Martin's Year Book," there were, at the end of 1873, telegraph lines of the length of 3745 miles, and wires of the length of 5845 miles.

The government of Norway is a constitutional monarchy. The executive is represented by the king, who exercises his authority through a Council of State, composed of one minister of state and nine councillors. The legislative power of the realm is the Storting, or Great Court, the representative of the sovereign people.

On the 1st of January, 1874, the troops of the land numbered 13,000 men. The reserve forces at the same time numbered 19,000, and the landwaern 11,000 men. The naval force comprised, at the same date, twenty vessels, all steamers, with an armament of 149 guns.

Commission from NORWAY to the International Exhibition :

HERMAN BAARS.

WM. C. CHRISTOPHERSEN.

GERHARD GADE, U. S. Consul.

NORWAY.

(*North of Nave, Columns 4 to 7.*)

Mining and Metallurgy.

Minerals, Ores, Building Stones, Mining Products.

- | | |
|--|--|
| <p>1 Geological Survey of Southern Norway, Director Th. Kierulf, Christiania.
 <i>a</i> Stones, eruptive rocks, leading strata, constituents of coarse granite dykes. 100
 <i>b</i> Manuscript maps, natural sections, generalized representations, printed maps. 335</p> <p>2 Fasmer & Son, I. H., Bergen.—Feldspar. 100</p> <p>3 Hinderager Mining Co., Bergen.—Copper ore, pyrites. 100</p> <p>4 Hoyem, Andr., Bergen.—Titanium iron ore. 100</p> <p>5 Kongsberg Silver Mines, Kongsberg.
 <i>a</i> Ores, crystals. 100
 <i>b</i> Silver in bars. 110</p> <p>6 Bamble Nickel Mines, Johan Dahll, Kragero.—Samples of nickel ores, with specimens illustrative of the melting process. 100</p> <p>7 Glorud Nickel Co., F. H. Frolich & Son, Christiania.—Nickel ores. 100</p> <p>8 Luttensee, Georg, Christiania.—Quarry stone for street pavement and curbstones. 102</p> | <p>9 Moestue & Co., Thv., Christiania.—Slates for tables, roofs, and floors, from Slidre quarries. 102</p> <p>10 Pettersen, Karl, Tromso.—Granite, labbro and other massives, raw and polished, geological map with description. 102</p> <p>11 Frolich & Son, F. H., Christiania.—Collection of Norwegian apatite ores (phosphate of lime). 103</p> <p>12 Birch, F., Selboe.—Millstones. 106</p> <p>13 Geological Survey of Southern Norway, Assistant Geologists W. Brogger and H. Reusch, Christiania.—Contents of giant-kettles, spiral marked interior grinding-stones. 106</p> <p>14 Christiania Millstones Manufacturing Co., Christiania.—Millstones. 106</p> <p>15 Lönseth, Fred., Christiania.—Millstones from Sælbo, flint millstones. 106</p> <p>16 Royal Norwegian Commission, Christiania.—Iron and steel from Messrs. J. Aall & Son, Næs & Egeland's Foundries. 111</p> <p>17 Cathrineholms Iron Works and Foundry, Fredrikshald.
 <i>a</i> Stoves and other wrought iron. 222
 <i>b</i> Anchors, chains. 284</p> |
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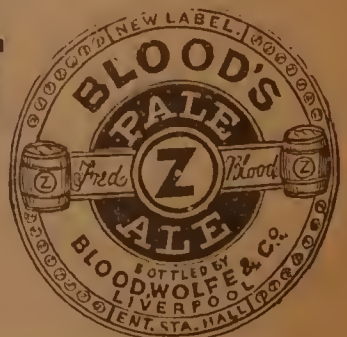
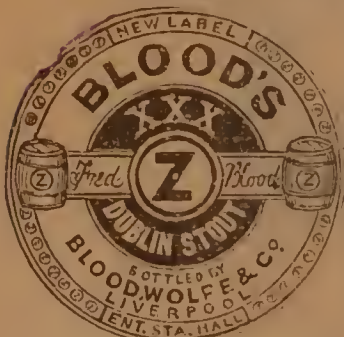
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ITALY.—STATISTICAL PREFACE.

THE geographical territory comprised under the name of Italy consists of a considerable stretch of peninsular mainland, besides several islands, situated in Southern Europe, between latitude $36^{\circ} 35'$ and 47° north, and between longitude $6^{\circ} 35'$ and $18^{\circ} 35'$ east. From the southern extremity of Sicily to the Alps its maximum length is about 600 miles, its utmost breadth being 300 miles. Its boundaries on the north are Austria and Switzerland, on the south the Mediterranean, on the west France and the Mediterranean, and on the east the Ionian and Adriatic seas, while its natural limits are strongly defined by the Alps and the sea.

The first general census of the kingdom of Italy was taken by the government on the 31st of December, 1871, on which date the population numbered 26,796,073 souls, living on an area of 296,013 square chilos, or 112,677 English square miles. The density of population was 237 per English square mile.

The kingdom of Italy is administratively divided in 69 provinces, as follows :

	POPULATION.	
PIEDMONT AND LIGURIA.		
1. Alessandria,	683,361	
2. Cunco,	617,232	
3. Genoa,	716,284	
4. Novara,	624,969	
5. Porto Maurizio,	127,042	
6. Turin,	972,988	
	<hr/>	3,741,876
ISLAND OF SARDINIA.		
7. Cagliari,	392,981	
8. Sassari,	243,274	
	<hr/>	636,255
LOMBARDY.		
9. Bergamo,	368,152	
10. Brescia,	456,023	
11. Como,	477,642	
12. Cremona,	300,595	
13. Milan,	1,009,794	
14. Pavia,	448,357	
15. Sondrio,	111,240	
	<hr/>	3,171,803
EMILIA.		
16. Bologna,	439,232	
17. Ferrara,	216,545	
18. Forli,	234,090	
19. Massac Carrarc,	161,944	
20. Modena,	273,231	
21. Parma,	264,509	
22. Piacenza,	225,775	
23. Ravenna,	220,801	
24. Reggio,	240,635	
	<hr/>	2,276,762

	POPULATION.	
THE MARCHES.		
25. Ancona,	262,369	
26. Ascoli Piceno,	203,008	
27. Macerata,	236,994	
28. Pesaro e Urbino,	213,072	
	<hr/>	915,443
UMBRIA.		
29. Perugia,		549,833
TUSCANY.		
31. Arezzo,	234,645	
31. Florence,	766,611	
32. Grosseto,	107,457	
33. Leghorn,	118,851	
34. Lucca,	280,399	
35. Pisa,	265,959	
36. Sienna,	206,446	
	<hr/>	1,980,368
NEAPOLITAN PROVINCES.		
37. Aquila,	332,782	
38. Avellino,	375,237	
39. Bari,	604,540	
40. Benevento,	232,012	
41. Campobasso,	364,843	
42. Caserta,	695,754	
43. Catanzaro,	412,226	
44. Chieti,	340,299	
45. Cosenza,	440,272	
46. Foggia,	322,754	
47. Lecce,	493,574	
48. Naples,	908,029	
49. Potenza,	509,202	
50. Reggio,	353,606	
51. Salerno,	541,739	
52. Teramo,	245,684	
	<hr/>	7,171,553
SICILY.		
53. Caltanissetta,	230,066	
54. Catania,	495,240	
55. Girgenti,	289,018	
56. Messina,	420,649	
57. Palermo,	617,660	
58. Siracusa,	294,915	
59. Trapani,	236,388	
	<hr/>	2,583,936
VENETIA.		
60. Belluno,	175,370	
61. Mantua,	288,942	
62. Padua,	364,355	
63. Rovigo,	200,835	
64. Treviso,	352,538	
65. Udine,	481,787	
66. Venezia,	337,539	
67. Verona,	367,426	
68. Vicenza,	363,161	
	<hr/>	2,931,953
69. ROME,		836,291

According to the old political division, the population is divided as follows :

Piedmont and Liguria,	3,741,876
Island of Sardinia,	636,255
Lombardy,	3,171,803
Emilia,	2,276,762
The Marches,	915,443
Umbria,	549,833
Tuscany,	1,980,368
Neapolitan Provinces,	7,171,553
Sicily,	2,583,936
Venice,	2,931,953
Rome (States of the Church),	836,291
	<hr/>
	26,796,073

The physical aspect presented by the surface of Italy is diversified in the extreme. Northern Italy is, for the most part, composed of one great plain—the basin of the Po, comprising all Lombardy and a considerable portion of Piedmont and Venice, bounded on the northwest and partly on the south by different alpine ranges. Throughout Central Italy, the great Apennine chain gives a picturesque irregularity to the physical configuration of the country, which in the southern extremity of Italy assumes still wilder forms. In the highland districts of Naples in which the Apennine ridge reaches its maximum elevation (10,000 feet), the scenery exhibits a savage grandeur. Along the extensive coast plains, as well as in the sub-Apennine valleys, the rural charms of this portion of Italy are extreme, while the brilliant flora and vegetation impart to it a novel character of beauty. The chief mountain system of Italy is the frontier ridge of the Alps, and their noble continuation, the Apennines.

Italy likewise comprises a considerable stretch of volcanic zone, which traverses the peninsula from the centre to the south in a line parallel with that of the Apennines, and of which the most remarkable active summits are Vesuvius, adjoining Naples, Ætna in Sicily, and Stromboli in the Lipari Isles.

The great plains of Italy are those of Lombardy, which stretch from the Mincio to the Ticino and the Po; of Piedmont; the Venetian plains; the plain of the Roman legations; the plain of the Campo Felice, on which stands Vesuvius; the Apulian plain; the long, narrow Neapolitan plain of the Basilicata, 100 miles in length, and 24 miles in breadth, stretching along the Gulf of Tarento.

The great majority of the rivers of Italy are only navigable for small coasting boats or barges. By far the most important is the Po, which rises on the borders of France, and flows into the Adriatic. It has numerous tributaries. Among the others may be mentioned the Adige, Brenta, Piave, Tagliamento, Aterno, Sangro, Metauro, Ofanto, Bradano, also belonging to the Adriatic basin; the Arno, the Tiber, the Ombrone, the Garigliano, and the Volturno, which belong to the Mediterranean basin.

The canal system of Italy is most extensive in the north. Nine principal canals in Lombardy administer to the irrigation of the plains and to the purposes of commercial communication, contributing in no small degree to the prosperity of the district. The Naviglio Grande or Ticinello is the finest hydraulic construction in Italy; it communicates between the Ticino and Milan, and has a course of 28 miles, navigable for vessels of large size. It was begun in 1179. The Naviglio Martesana, 38 miles long, unites Concesa on the Adda with Milan; the Naviglio di Pavia is 18 miles in length; the bifurcated Naviglio d'Ostiglia unites the Po with the Adige. 253 canals intersect Piedmont, extending over a length of 1932 kilometres. Venice comprises 203 navigable, and 40 minor canals. Numerous canals have been constructed for the drainage of the Pontine Marshes. This system of water communication was early carried to a high degree of efficiency in Italy, and is of incalculable service in the agricultural districts.

The mountain lakes of Italy are famed for their picturesque beauty. They are mostly in the northern provinces of Lombardy and Venetia. The principal are Maggiore, Lugano, Como, Isco, and Garda. The Roman lakes of Perugia, Bolseno, and Bracciano, that of Gastiglione in Tuscany, and Celano in Naples, also deserve mention.

The mineral and thermal springs of Italy are innumerable, and possess a great variety of curative and sanitary properties.

In the northern provinces, the climate is temperate, salubrious, and frequently severe in winter; in the centre, it assumes a more genial and sunny character: while the heat of the southern extremity is almost of a tropical intensity. The singular clearness of the atmosphere sets off the landscape and monumental beauties of Italy with brilliant effect. The drawbacks of Italy's climate are the picreing tramontana or mountain winds; the deadly sirocco, which blights all nature at seasons along the western coast; and the malaria or noxious miasmata which issues from the Maremma of Tuscany, the Pontine Marshes, and the Venetian lagoons, generating pestilential fevers and aguish diseases in the summer season. The mean temperature of the leading divisions of the country throughout a whole year was as follows: Milan, 55° 4' of Fahrenheit's scale; Rome, 59°; Palermo, 62° 5'; and in Sardinia, 60° 5'. The highest temperature at Rome rises to 95°, and in Sicily from 97° to 104°.

The staple products of Italy are corn, wine, oil, raw silk, rice, olives, and fruits. Hemp, flax, and cotton are also largely grown. The sugar-cane is successfully cultivated in the two Sicilies. Agriculture, except in the north, is in a very backward condition. It is calculated that only two-thirds of the area of the kingdom capable of production are cultivated, and that the rest lies waste. The superficial extent of the productive soil of Italy is 23,017,096 ellaras,* divided thus:

	ELLARAS.
Arable land,	11,003,061
Meadow land,	1,173,436
Rice ground,.	144,903
Olive plantations,.	554,767
Chestnut plantations,	585,132
Woods and forests,	4,158,349
Pastures,	5,397,448
Total,	23,017,096

There are, besides, 3,997,059 ellaras of rock and marsh. Of the land capable of cultivation, more than half is devoted to the growth of cercals, mainly wheat. The average crop is insufficient for the supply of the country. The wines of Naples are esteemed the best, small quantities of the famous *Lachrima Christi* and the *Vind d'Asti* being exported, while the Sicilian wines of Marsala form a considerable item of export. The best oil and olives are furnished by Tuscany, Lucca, and Naples. Silk is chiefly manufactured in the northern provinces, the cultivation of the mulberry and the rearing of the silkworm forming, in Lombardy, a most important interest. The best manufactured silk comes from Piedmont, Tuscany, and the Roman provinces. The fruits of the two Sicilies are exquisite in flavor, and embrace several tropical species. Oranges, lemons, almonds, figs, dates, melons, and the pistachio nut, are common to all orchards, and are largely exported. A considerable cheese trade exists in the northern provinces.

The sea and fresh water fisheries of Italy are considerable, the Mediterranean furnishing immense quantities of tunny, anchovies, sardines, mullets, pelchards, and mackerel. The export of anchovies and of sardines is of immense extent. The

* One ellara equals 2.47 acres.

river fisheries yield salmon, trout, sturgeon, lampreys, tench, barbel, etc. The crustaceans and shell fish of the Italian seas are of great variety and delicate flavor, and are a favorite article of Italian consumption.

The total exports of the kingdom, during the year 1874, were 1,304,994,328 lire;* the imports, during the same year, 985,458,532 lire.

The number and tonnage of merchant vessels belonging to the kingdom, on January 1st, 1874, were as follows: 17,562 sailing vessels, aggregating 925,337 tons burthen; and 103 steamers, of a total burthen of 24,476 tons. Of the sailing vessels, 9074 were under 6 tons each.

According to the present constitution of Italy, the executive power belongs exclusively to the sovereign, and is exercised by him through responsible ministers. The legislative authority vests conjointly in the king and parliament, the latter consisting of two chambers, a Senate and a Chamber of Deputies. The Senate is composed of the princes of the royal house who are of age, and of an unlimited number of members, above forty years old, who are nominated by the king for life; a condition of the nomination being that the person should either fill a high office, or have acquired fame in science, literature, or any other pursuit tending to the benefit of the nation: or, finally, should pay taxes to the annual amount of 3000 lire. The members of the Chamber of Deputies are elected by a majority of all citizens who are twenty-five years of age and pay taxes to the amount of 40 lire. A deputy must be thirty years old, and must have the requisites demanded by the electoral law, among them a slight property qualification. Neither senators nor deputies receive any salary.

The following are the budget estimates for 1875:

Estimated revenue,	1,344,164,158 lire.
Estimated expenditures,	1,575,487,190 "

The entire public debt, at the end of 1873, was 9,757,613,267 lire.

The actual strength of the army, at the end of December, 1873, was:

Number of men under arms (peace footing),	199,557
Number of men on unlimited furlough,	244,952
Total (war footing),	444,509

The navy, at the commencement of 1875, consisted of 95 ships of war, carrying 1256 guns. Of these, 9 were ironclads, carrying 346 guns, 46 were screw steamers, carrying 693 guns, and 32 paddle steamers, carrying 113 guns.

The total length of railways opened for traffic, at the end of 1874, was 4607 English miles.

The number of post offices at the commencement of 1874 was 2709. In the year 1873 the post office carried 504,402,431 letters and 94,402,596 printed parcels.

The length of telegraphic lines, on the 1st of January, 1874, was 12,622 English miles, nearly two-thirds of the whole belonging to the government. There were, at the same date, 1408 telegraphic offices. The number of private telegrams during 1873 was 4,670,090, and of official telegrams, 163,852.

Under the new Italian government, a great part of the property confiscated from the monastic establishments has been devoted to the cause of public education. In addition to this, the Parliament votes an annual credit of 15,000,000 lire for the same purpose. Since the commencement of the year 1860 there were opened throughout the kingdom thirty-three model schools. Notwithstanding these important aids to instruction, education still stands very low. According to the census of 1864, out of a total population of 21,703,710 souls, there were about 17,000,000 who could neither read nor write. Piedmont occupied the first place, Sicily the last, on the register of knowledge. In the Basilicata, Calabria, and Sicily, more than nine-tenths of the population could neither read nor write.

* One lire equals 19.3 cents gold.

There are twenty-two universities in Italy, many of them of ancient foundation. By a decree of the Minister of Public Instruction, issued in 1871, six high-schools—Naples, Pavia, Turin, Bologna, Florence, and Parma—were declared first-class universities of the kingdom. The number of students at all the universities was returned as 10,524 in 1871.

Commission from ITALY to the International Exhibition :

H. E. BARON BLANC, Minister Plenipotentiary.

COUNT B. LITTA, First Secretary of Legation.

CHEVALIER ALONZO M. VITI, Vice-Consul.

ANGELO M. GIANELLI, Agent of the Central Committee of Florence.

ITALY.

(*North of Nave, Columns 1 to 5.*)

Mining and Metallurgy.

Minerals, Ores, Stone, Mining Products.

- 1 Tagliavia, Francesco, & Co., Messina.—Collection of minerals. 100
- 2 Fontana Brothers, Luserna, Turin.—Flagstones. 102
- 3 Tassi, Peter, Leghorn.—Yellow marble and alabaster. 102
- 4 Chamber of Commerce and Arts, Sienna.—Marble and alabaster stone. 102
- 5 Stock Company for Manufacturing Bricks, Reggio, Emilia.—Cement, limestone. 103
- 6 Crispo, Monceada Carlo, Catania.—Limestone. 103
- 7 Maccagnani, Ulisse, Bologna.—Aromatic earth of Cattui. 104
- 8 Bolari and Yellow Earth Co., Sienna.—Bolari and yellow earth, earth for coloring. 104
- 9 Furse, Drottey, & Co., Rome.—Bolari earth of Sienna. 104
- 10 Molfini, Luigi, Genoa.—Lithographic stone. 106
- 11 Scammano Cav. Michele, Catania.—Cedrats 107

- 12 Birindelli, Carlo, Florence.—Colalli water. 107
- 13 Spedalieri, Ba Felice, Catania.—Sulphur. 107
- 14 Count Aristide, Castrocaro.—Mineral waters. 107
- 15 Romano, Gaetano, Palermo.—Sulphur. 107
- 16 Scavo Vita Brothers, Catania.—Sulphur. 107
- 17 Dily, Edoardo, Catania.—Sulphur. 107
- 18 Ardizzone, Francesco, Catania.—Sulphur. 107
- 19 Pennini, Baron of Floristallo, Catania.—Sulphur. 107
- 20 Cesena Sulphur Co. (limited), Cesena.—Raw and refined sulphur. 107
- 21 Bartolini dott Cesare, Sienna.—Fossil flour. 107

Metallurgical Products.

- 22 Fornara, Gio., & Co., Turin.—Wire. 111
- 23 Ponsard & Gigli, Florence.—Iron, manganese. 111

BRAZIL.—STATISTICAL PREFACE.

BRAZIL is the most extensive state of South America. Towards the interior, it borders on all the other states of that continent except Chili and Buenos Ayres—on Uruguay, the Argentine Confederation, Paraguay, Bolivia, Peru, Ecuador, New Granada, Venezuela, and English, Dutch, and French Guiana; while its seaboard, beginning about 200 miles to the north of the Amazon, and reaching to within the same distance of the Plata, projects into the Atlantic fully 1000 miles to the east of the direct line between its two extremes. This immense country extends between latitude $4^{\circ} 30'$ north and 33° south, and between longitude 35° and 70° west, being, in round numbers, 2600 miles long and 2500 broad. The area, according to official accounts, is 3,100,000 square miles, with a population, in 1872, of 10,196,328 including 1,683,684 slaves, and consisting of aboriginals, Africans, and Europeans, the first being proportionately fewer than in most parts of America.

Brazil differs in many respects from most of the other divisions of the new continent. It knows nothing of the volcanoes and earthquakes of the Pacific coast; with winds blowing constantly from the Atlantic Ocean, it is exempted from those droughts which are always blighting one or other of the slopes of the Andes, the remoter slope in Peru and Chili, and the nearer in Buenos Ayres and Patagonia; its mines, again, are as famous for gold and diamonds as those of the western Cordilleras for silver. In its hydrography, Brazil contrasts unfavorably with the other divisions. While the Amazon and the Plata, the Mississippi and the St. Lawrence—not to mention countless rivers of inferior magnitude on both shores—are for the most part practicable almost to their sources, the streams of Brazil, with the exception of the Amazon, are mostly impeded throughout by cataracts and shallows, thus counterbalancing, as it were, its matchless seaward facilities by the deficiencies of its inland communications. Further, the most navigable of these streams, instead of entering the open sea, mingle their waters with those of the Plata or of the Amazon—the Parana and the Uruguay joining the former, and the Madeira, the Tapajos, the Zingu, and the Tocantins, the latter; and even among those that do send their tribute at once to the ocean, a similar direction is sometimes impressed by the dividing ridges—the San Francisco, for instance, by far the largest of them, running to the northward parallel with the southeast coast through 11° of latitude, and leaving only 4° of longitude for its remaining course to the Atlantic. These hydrographic peculiarities must be the more strongly felt, inasmuch as a humid surface and a luxuriant vegetation conspire to render ordinary roads all but impossible.

Among the mineral treasures, besides gold and diamonds, already mentioned, iron of superior quality is abundant; and salt, also, is extensively produced in saline marshes by the alternate processes, according to the season, of inundation and evaporation. The productions of the soil are, of course, equally various and rich. The cotton is naturally excellent, and the tea-plant of China has been introduced, though hitherto with indifferent success. The exports necessarily vary in different sections of the country. From the north, they are coffee, cotton, cocoa, sugar, and tobacco; from the south, hides, tallow, horns, etc.; and from the middle, drugs, diamonds, gold dust, dyes, rice, manioc, tapioca, spirits, and rosewood.

The total value of the imports into Brazil, including bullion and specie, averaged about \$91,000,000 in the five years, 1869-1873, and that of the exports during the same period, likewise including bullion and specie, about \$110,000,000.

The executive authority is vested in the Emperor, who, besides being aided by a council of state, must act through responsible ministers. The legislature consists of two chambers, which sit four months every year. Both the deputies and the senators, who must have annual incomes respectively of 800 milrees and 1600, are indirectly elected by voters who must possess 200 milrees per annum—the former for four years, and the latter for life. The senate, however, appears to represent the crown as well as the people, inasmuch as each constituency merely nominates three individuals for his majesty's choice of one. Justices of the peace, also, are appointed by the respective communities; and in the courts generally, whether civil or criminal, there prevails trial by jury.

The budget for the year ending June 30th, 1876, calculates the receipts at 107,133,070 milrees, and the expenditures at 102,634,053 milrees.* The public debt, on the 1st of April, 1875, was, including paper money, 664,739,395 milrees.

In a vote passed by the House of Congress, June, 1869, the strength of the standing army was fixed at 30,000 on the peace footing, and at 60,000 on the war footing. There were actually under arms, according to official reports, at the end of April, 1874, 28,933 troops, of which number 2397 were in garrison in Paraguay.

The imperial navy consisted, in 1875, of 61 men-of-war, carrying 230 guns, and crews aggregating 4136.

The empire possessed, at the end of 1873, railways of a total length of 714 English miles, open for traffic. There were railways of an aggregate length of 397 miles in course of construction at the end of June, 1874. There were, at the beginning of the year 1874, telegraph lines to the extent of 3375 miles. The number of offices was 74 at the same date. The post office carried 12,251,000 letters in the year 1873, of which number 6,548,000 came from or to Rio de Janeiro, the capital.

Commission from BRAZIL to the International Exhibition:

HIS HIGHNESS, GASTON D'CRLEANS, Conde d' Eu, Marshal of the Army, President.

VISCOUNT DE JAGUARY, 1st Vice-President.

VISCOUNT DE BONN-RETIRO, 2d Vice-President.

HIS EXCELLENCY, A. P. DE CARVALHÔ BORGES, Envoy Extraordinary and Minister

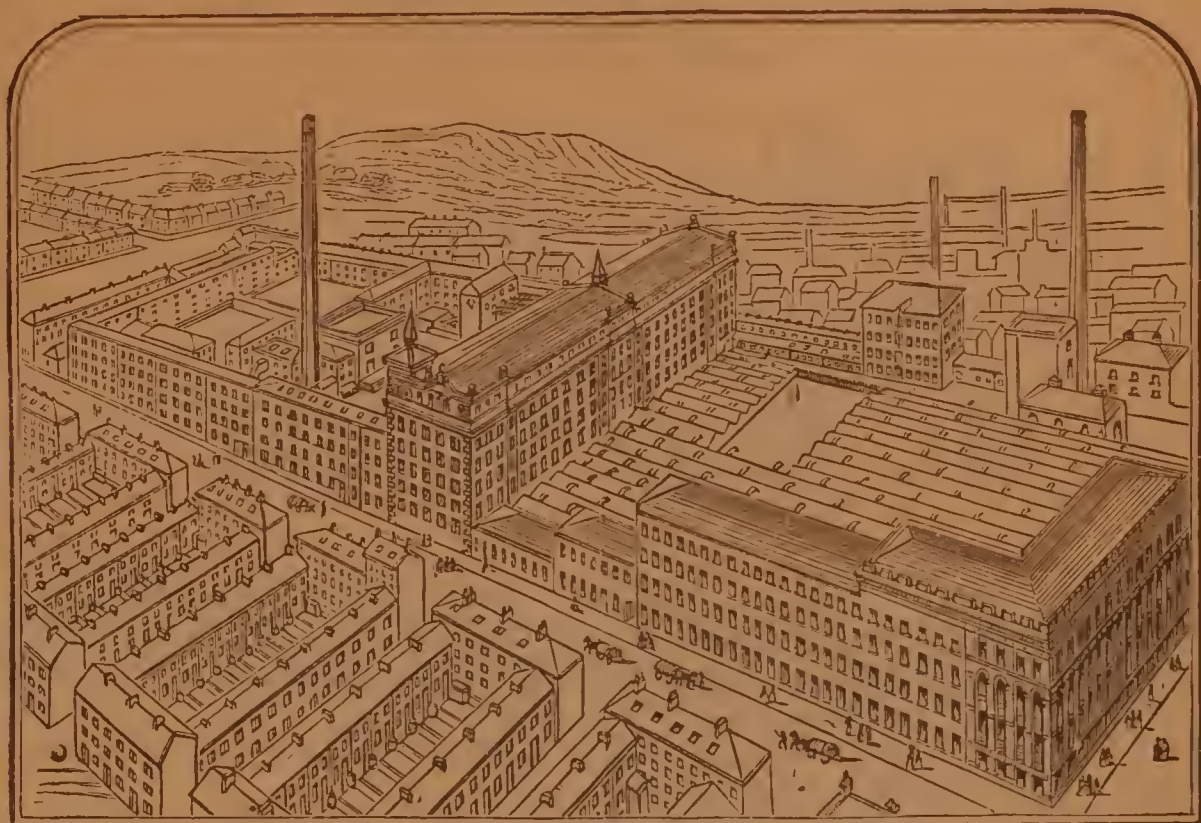
Plenipotentiary of His Majesty the Emperor of Brazil.

VISCOUNT DE SOUZA FRANCO.

JOAQUIN ANTONIO DE AZEVEDO.

* The milrees = 1000 reis.

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BRAZIL.

(North of Nave, Columns 58 to 61.)

Minerals, Metallurgical Products.

Minerals, Ores, Stone, Mining Products.

- 1 Province of Parana.
 - a Specimens of rocks and quartz. 100
 - b Slates. 102
 - c Lime. 103
 - d Clays, kaolin, and yellow and white argil. 104
- 2 Province of Goyaz.—Minerals. 100
- 3 Garceix, Prof.—Collection of minerals from the province of Minas-Geraes. 100
- 4 Lemos, T.—Collection of minerals. 100
- 5 Góes, Pereira de.—Collection of minerals. 100
- 6 Province of Alagoas.—Minerals. 100
- 7 Director-General of the Colony of Mucury.—Collection of minerals. 100
- 8 Province of Bahia.—Collection of minerals. 100
- 9 Province of Minas-Geraes.—Rough diamonds. 100
- 10 Province of Rio-Grande-do-Sul.
 - a Minerals. 100
 - b Coal. 101
 - c Marble. 102
- 11 Province of S. Paulo.
 - a Collection of minerals. 100
 - b Argil. 104

- 12 Barbacena, Viscount de.—Coal. 101
- 13 Resende, X.—Pitchstone. 101
- 14 Villa-Franca, Baron de.—Peat. 101
- 15 Lendenberg, B.—Lime and cements. 103
- 16 Zuparana, Baron de.—Calcareous specimens. 103
- 17 Freitas, Teiyeira de.—Lime. 102
- 18 Ostermalk, Ch.—Lime. 103
- 19 Carrea, Lurenco.—Argil from Jaboticabal (province of S. Paulo). 104
- 20 Souza, Paulo.—Argil. 104
- 21 Gonçalves, José.—Calcined kaolin. 104
- 22 Province of Minas-Geraes.—Crystallized quartz. 106
- 23 Ribas, La.—Pumice stone. 108

Metallurgical Products.

- 24 Province of Goyaz.—Golddust. 110
- 25 Lemos, P. L., & Miranda, Leone.—Golddust and auriferous minerals. 110
- 26 Province of Sancta Catharina.—Iron and nickel. 111
- 27 Ipanema Iron Works.—Iron. 111
- 28 Garre, F.—Milled lead. 113

ARGENTINE REPUBLIC.—STATISTICAL PREFACE.

THE Argentine Republic—the confederation of the Rio de la Plata, or River of Silver, South America—is a federal union of fourteen provinces and three large territories, covering an almost unbroken plain of 1,200,000 square miles, with a population of about 2,000,000 inhabitants. It extends from 22° south latitude to the straits of Magellan, and from 59° west longitude to the Andes.

Each province has its own legislature, courts of justice, and political government; but civil, penal, and commercial laws are common to all the provinces, codes of such laws having been issued by the congress of the confederation.

The President of the republic is elected for a term of six years by the representatives of the provinces, and is not eligible for re-election. The Vice-president, elected in the same manner, fills the office of chairman of the Senate, but has otherwise no political power. The President is commander-in-chief of the troops, and appoints to all civil, military, and judicial offices; but he and his ministers are responsible for

their acts, and liable to impeachment before the Senate by accusation of the House of Representatives. Legislative power is vested in a Senate, of members elected by the provincial legislatures, two from each province, and a House of Representatives, elected by the people, and apportioned to each province according to population. The senators hold their office for nine years, and the representatives for three.

The chief exports of the country are wool, hides, salt beef, and tallow; but its resources embrace all the products of the tropical and temperate zones, as may be seen by the catalogue of its exhibits.

The farming stock of the republic is estimated at 15,000,000 horned cattle, 4,000,000 horses, and 80,000,000 sheep, whose aggregate value cannot fall short of \$200,000,000, gold, yielding about \$50,000,000 of export produce per annum.

The total trade may be estimated at \$100,000,000 per annum. In 1874 the imports amounted to \$55,961,117, against over \$71,000,000 in the previous year. The exports amounted to \$43,104,712, against \$45,869,314 in 1873. The decrease in imports and exports was caused by a severe commercial crisis, from which the country is just recovering.

The annual revenue amounted to \$20,217,231 in 1873, but the crisis reduced it in 1874 to \$16,090,661, or over \$2,000,000 less than in 1872, and nearly \$4,500,000 less than in 1873. The general expenditures in 1874 reached the sum of \$28,596,006. The total debt in January, 1875, was \$68,416,043.

The regular army numbers 10,807 men, divided as follows: cavalry 4800, infantry 4400, artillery 400, and 1173 special troops. The navy is composed of 26 vessels, among them 2 ironclads and 6 gunboats, with crews amounting in all to 900.

The capital of the republic is provisionally situated at the city of Buenos Ayres, capital of the province of the same name.

(The statistics given above have been furnished by the commission of the Argentine Republic.)

A network of railways, constructed mainly at the expense of the State, has been in progress for several years. At the end of the year 1873 there were 664 miles open for traffic, and 642 miles of State railways in course of construction. There were besides, at the end of 1873, railways of a total length of 1997 miles, sanctioned by the government, including an international line from Buenos Ayres to Chili, of 894 miles.

At the end of September, 1873, there were 4170 miles of telegraph lines in operation. The total length of telegraph wires at the same date was 8267 miles. The number of telegraphic dispatches during the same year was 170,079.

The post office, in the year 1873, carried 1,493,700 parcels and packets, and 4,574,188 letters. The number of letters carried doubled in the five years from 1869 to 1873.

Commission from the ARGENTINE REPUBLIC to the International Exhibition:

CARLOS CARRANZA, President.

EDWARD SHIPPEN, Vice-President.

EDW. T. DAVISON, Treasurer, Consul-General.

DIEGO DE CASTRO, Secretary.

E. MARA DAVISON, Deputy Member.

Central Committee.

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RICARDO NEWTON,
LEONARDO PEREYRA,
JOSE M. JURAFDO,
EMILIO DUPORTAL.

ARGENTINE REPUBLIC.

(Nave to South Avenue, Columns 2 to 5.)

Minerals, Ores, Stone.

Minerals, Ores, Stone, Mining Products.	
1 Raymond, Hipolito, Province of Mendoza.—Collection of minerals.	100
2 Provincial Commission, Province of Mendoza.—Collection of minerals.	100
3 Lemos, Abraham, Province of Mendoza.—Minerals for paints.	100
4 Treloar, Guillermo A., Province of La Rioja.—Collection of minerals.	100
5 Almonacid & Parchappe, Province of La Rioja.—Collection of minerals.	100
6 Illanes, Manuel J., Province of La Rioja.—Minerals of Cerro de Vinchina.	100
7 Bas-cuñan, Francisco, Province of La Rioja.—Minerals.	100
8 Provincial Commission, Province of La Rioja.—Minerals.	100
9 Gelos, Martin, Province of La Rioja.—Minerals of Oita.	100
10 Vega, Daniel de la, Province of La Rioja.—A petrification.	100
11 Schröder, Teodoro, Province of La Rioja.—Copper ore.	100
12 Gifford, S., Province of La Rioja.—Silver ore.	100
13 Aguilar, Francisco D., Province of San Juan.	
<i>a</i> Minerals.	100
<i>b</i> Mineral waters.	107
14 Government of the Province of San Juan.—Collection of minerals.	100
15 Provincial Commission, Province of San Luis.—Collection of minerals.	100
16 Metzler, A., Province of Catamarca.—Minerals.	100
17 Romay, Gabriel, Province of Catamarca.—Iron and antimony ores.	100
18 Provincial Sub-commission of Tinogasta, Province of Catamarca.—Ores of iron, lead, copper, silver, etc.	100
19 Galindez, Clásico, Province of Catamarca.—Silver ore.	100
20 Villafañe, Tristan, Province of Catamarca.—Silver-bearing galena.	100
21 Resoagli, Luis, Province of Corrientes.—Quartz, flint, agate, etc.	100
22 Mansilla, Manuel, Province of Corrientes.—Quartz and agate.	100
23 Galarraga, E. G. de, Province of Corrientes.—Crystal rock.	100
24 Sicard, Juana G. de, Province of Corrientes.—Horn-shaped stone.	100
25 Porta, Felix, Province of Corrientes.—Agglomeration of small stones.	100
26 Acosta de Quirolo, Iosefa, Province of Corrientes.—Crystal rock.	100
27 Cuña, Americo, Province of Corrientes.—Agate.	100
28 Cabral y Melo, José Maria, Province of Corrientes.—Crystal rock and flint.	100
29 Pujol, Nicanor, Province of Corrientes.—Iron ore.	100
30 Córdoba University, Province of Córdoba.—Collection of minerals.	100
31 Fragneiro, José M., Province of Córdoba.—Lead containing silver.	100
32 Provincial Commission, Province of Córdoba.	
<i>a</i> Lead containing silver, gypsum, various minerals.	100
<i>b</i> Marble.	102
<i>c</i> Whetstones.	106
33 Vasquez, Lucrecio, Province of Córdoba.—Emeralds; round-shaped stone made by Indians.	100
34 MacDowell, N., Province of Córdoba.—Minerals.	100
35 Olmos, José V., Province of Córdoba.—Minerals.	100
36 Provincial Commission, Province of Salta.	
<i>a</i> Galena, silver, iron.	100
<i>b</i> Sulphate of lime.	103
<i>c</i> Kaolin.	104
37 Echevarria, Cecillo, Province of Santa Fé.—Minerals; quartz and agates of Alto Uruguay.	100
38 Rap, Eugenio, Province of Tucuman.—Collection of minerals.	100
39 Government of the Province of Jujuy.—Silver ore from Tilcará.	100
40 Sub-commission of the Department of Diamante, Province of Entre-Rios.—Stones found on the shores of the Plata y Uruguay.	100
41 Arguello, David, Province of Córdoba.	
<i>a</i> Silver ore.	100
<i>b</i> Anthracite coal.	101
42 Galvan, Federico, Province of La Rioja.—Coal from Tumbillos.	101
43 Roman, Gabriel, Province of Catamarca.—Coal.	101
44 Valdes, Emiliano, & Cipriano, Province of Buenos Ayres.—Colored and other stones from Tandil.	102
45 Olmos, José V., Province of Córdoba.—White marble.	102
46 Salas, Manuel M., Province of Corrientes.—Marble and crystallized stones.	102
47 De los Santos, Francisco A., Province of Corrientes.—Hollow unpolished stone.	102

Minerals, Stone, Artificial Stone.

- 48 Hurley, Tomás, Province of Catamarca.—Granites; copper and black bronzes; antique pieces of stone discovered in the abandoned mine of Ortiz. 102
- 49 Diaz, Eulogio, Province of Corrientes.—Rough stone. 102
- 50 Provincial Commission, Province of Santiago del Estero.—Dressed stones from the Sierra de Guasayan. 102
- 51 Provincial Commission, Province of San Juan.—Building stone. 102
- 52 Provincial Commission, Province of San Luis.—Stone pestle used by the Indians to grind corn and other grains; stone pan made by Indians, etc. 102
- 53 Segura, Rufino, Province of Catamarca.—Soapstone, flagstone. 102
- 54 Provincial Commission, Province of Catamarca.—Soapstone from Ancasti. 102
- 55 Sub-commission of Andalgalá, Province of Catamarca.—Soapstone from Belen. 102
- 56 Riso, Isidoro, Province of Catamarca.—Soapstone. 102
- 57 Herrera, Nicolas, Province of Catamarca.—Slate. 102
- 58 Cornejo, Melchora, Province of Salta.—Carbonate of lime. 103
- 59 Saravia, Pablo, Province of Salta.—Sulphate of lime. 103
- 60 Fornasari, R., & Facino, H., Province of Entre-Rios.—Hydraulic cement, artificial stones. 103
- 61 Commission of Parana, Province of Entre-Rios.—Paving-stones, limestones, lime, sulphate of lime, petrified oyster-shells, etc. 103
- 62 Garlive, N., Province of Entre-Rios.—Artificial stone. 103
- 63 Peretti, Santiago, Province of Salta.—Dressed stone and carbonate of lime. 103
- 64 Sub-commission of the Department of Diamante, Province of Entre-Rios.—Hydraulic cement stones and cement, lime, artificial stone, petrified wood, etc. 103
- 65 Solá, Ramon, Province of Entre-Rios.—Gypsum. 103
- 66 Justice of the Peace of Ensenada, Province of Buenos Ayres.—Lime shells. 103
- 67 Pedruncini, Juan, Province of Buenos Ayres.—Shell-lime. 103
- 68 Valdes, Nicasio, Province of Buenos Ayres.
a Lime from Balcarce. 103
b Red clay. 104
- 69 Iñiguez, Manuel A., Province of Buenos Ayres.—Limestone from Tandil. 103
- 70 Commission of Aguas Corrientes, Province of Buenos Ayres.
a Lime-shells, calcareous stones, raw and burnt cement, cement in shape of bricks. 103
b Clay. 104
- 71 Welsh, Miguel, Province of Buenos Ayres.—Limestone, quicklime, slaked lime. 103
- 72 Caetani, Vicente, Province of Buenos Ayres.—Artificial marble. 103
- 73 Sandrot, José, Province of Buenos Ayres.—Artificial stones. 103
- 74 Justice of the Peace of Patagones, Province of Buenos Ayres.—Gypsum, etc. 103
- 75 Riso, Isidoro, Province of Catamarca.—Water-lime. 103
- 76 Provincial Commission, Province of Catamarca.
a Water-lime, gypsum. 103
b Colored clay, soapstone in powder, kaolin, etc. 104
c Mineral waters. 107
- 77 Ibañez, P., Province of Catamarca.—Stalagmitical lime. 103
- 78 Gelos, Martin, Province of La Rioja.—Calcinated lime, gypsum. 103
- 79 Provincial Commission, Province of La Rioja.—Lime; common gypsum. 103
- 80 Provincial Commission, Province of Tucuman.
a Black, yellow, and white limestone, common gypsum. 103
b White clay. 104
- 81 Paroni, Andrés, Province of Santa Fé.—Hydraulic cement. 103
- 82 Provincial Commission, Province of Corrientes.—Calcareous stones from Itati. 103
- 83 Aguilar, Francisco D., Province of San Juan.—Hydraulic lime. 103
- 84 Provincial Commission, Province of Santiago del Estero.
a Crystallized and common gypsum. 103
b Colored clay and saltpetre. 104
c Mineral and sarsaparilla waters. 107
- 85 Tamayo, Sidney, Province of Salta.—White clay. 104
- 86 Carenzo, Nicholas, Province of Salta.—Kaolin, white clay, and chalk. 104
- 87 Arias, Hilarion, Province of Salta.—Sulphate of lime. 104
- 88 Lopez, Feliciano, Province of Corrientes.—Clay for the manufacture of crockery, tiles, and bricks, yellow stone for coloring and paint. 104
- 89 Sub-commission of Bella Vista, Province of Corrientes.—Stone containing red and yellow coloring substances; clays. 104
- 90 Commission of the Department of Paraná, Province of Entre-Rios.—Clay, fine sand, Tripoli, calcareous clay containing gold and silver, etc. 104
- 91 Calderon, Pedro, Province of Entre-Rios.—Vegetable clay. 104
- 92 Fontes, V. M., & Negra, S., Province of Entre-Rios.—Clay for whitewashing. 104
- 93 Bazan, Abel, Province of La Rioja.—Refractory bricks. 104
- 94 Gelos, Martin, Province of La Rioja.
a Chalk. 104
b Whetstones of "La Torre" in their natural state; flint. 106
- 95 Barros, José, Province of La Rioja.—Refractory bricks. 104
- 96 Valdes, Emiliano & Cipriano, Province of Buenos Ayres.
a Black and white vegetable clay from Balcarce. 104
b Sand and whetstones. 106
- 97 Justice of the Peace of Zarate, Province of Buenos Ayres.—Black and ferruginous clays. 104

Minerals, Stone, Metallurgical Products.

- 98 Lobo, Tristan, Province of Catamarca.—Chalk clay, tiles, and bricks. 104
- 99 Quevedo, Samuel A., Lafone, Province of Catamarca.—White clay for bricks; hard fossil-ground quartz; refractory bricks. 104
- 100 Provincial Commission, Province of La Rioja.—White chalk and specimens of colored clay used in the manufacture of pottery and paints; colored chalk. 104
- 101 Caballero, Eugenio, Province of Salta.—Graphite. 105
- 102 Medina, Luis R., Province of Catamarca.—Whetstones of "La Concepcion." 106
- 103 Perez, Luisa, Province of La Rioja.—Mineral water. 107
- 104 Cornejo, F. de, Melchora, Province of Salta.—Mineral waters. 107
- 105 Patron Bros., Province of Salta.—Mineral waters. 107
- 106 Schmidt, Antonio, Province of San Luis.—Mineral waters. 107
- 107 Escobar, Juan de D., Province of San Luis.—White-stone water. 107
- 108 Sub-commission of the Colony of San Carlos, Province of Santa Fé.—Vegetable clay. 107
- 109 Otamendi, Carlos, Province of Buenos Ayres.—Shells from the coast of Balcarce. 107

Metallurgical Products.

- 110 Zorilla, Benjamin, Province of Salta.—Silver. 110
- 111 Bedoya, Segundo, Province of Salta.—Silver. 110
- 112 Molina & Carranza, Province of Catamarca.—Metals from the Rosario mine. 110
- 113 Nell, Federico, Province of San Luis.—Gold and washed gold. 110
- 114 Bertram & Co., Province of San Luis.—Gold from the Descubridora mine. 110
- 115 Provincial Commission, Province of San Luis.—Gold from La Carolina mine. 110
- 116 Salcedo, Uladislao M., Province of Catamarca.
a Silver. 110
b Copper. 112
- 117 Quevedo, Samuel Lafone, Province of Catamarca.—Alum, copper, calcined copper axle. 111
- 118 Muro, Froilan, Province of Catamarca.—Iron, copperas, alum, and sulphate of copper. 111
- 119 Mansilla, M. T., Province of Corrientes.—Copper and mica. 112
- 120 Tula, Nabor, Province of Catamarca.—Copper. 112
- 121 Galindez, Clásico, Province of Catamarca.—Copper and silver. 112

CLASSIFICATION.

DEPARTMENT II.—MANUFACTURES.

CHEMICALS.

CLASS 200.—Chemicals, pharmaceutical preparations.

Mineral acids, and the methods of manufacture. Sulphuric, nitric, and hydrochloric acids.

The common commercial alkalies, potash, soda, and ammonia, with their carbonates.

Salt and its production. Salt from deposits—native salt. Salt by solar evaporation from sea water. Salt by evaporation from water of saline springs or wells. Rock salt. Ground and table salt.

Bleaching powders and chloride of lime.

Yeast powders, baking powders.

CLASS 201.—Oils, soaps, candles, illuminating and other gases.

Oils from mineral, animal, and vegetable sources. Refined petroleum, benzine, naphtha, and other products of the manufacture. Oils from various seeds, refined, and of various degrees of purity. Olive oil, cottonseed oil, palm oil. Animal oils, of various kinds, in their refined state. Oils prepared for special purposes besides lighting and for food. Lubricating oils.

Soaps and detergent preparations.

Candles, stearine, glycerine, paraffine, etc., spermaceti.

Illuminating gas and its manufacture.

Oxygen gas, and its application for heating, lighting, metallurgy, and as a remedial agent.

Chlorine and carbonic acid.

CLASS 202.—Paints, pigments, dyes, colors, turpentine, varnishes, printing inks, writing inks, blacking.

CLASS 203.—Flavoring extracts, essences, perfumery, pomades, cosmetics.

CLASS 204.—Explosive and fulminating compounds; in small quantities only, and under special regulations, shown in the building only by empty cases and cartridges. Black powder of various grades and sizes. Nitro-glycerine and the methods of using and exploding. Giant powder, dynamite, dualin, tri-nitro-glycerine.

CLASS 205.—Pyrotechnics, for display, signaling, missiles.

CERAMICS—POTTERY, PORCELAIN, ETC.

CLASS 206.—Bricks, drain-tiles, terra cotta, and architectural pottery.

CLASS 207.—Fire clay goods, crucibles, pots, furnaces. Chemical stoneware.

CLASS 208.—Tiles, plain, enameled, encaustic; geometric tiles and mosaics. Tiles for pavements and for roofing, etc.

CLASS 209.—Porcelain for purposes of construction. Hardware trimmings, etc.

CLASS 210.—Stone china, for chemists, druggists, etc., earthenware, stoneware, faience, etc.

CLASS 211.—Majolica and Palissy ware.

CLASS 212.—Biscuit-ware, parian, etc.

CLASS 213.—Porcelain for table and toilet use, and for decoration.

GLASS AND GLASSWARE.

CLASS 214.—Glass used in construction and for mirrors. Window glass of various grades of quality and of size. Plate glass, rough, and ground or polished. Toughened glass.

CLASS 215.—Chemical and pharmaceutical glassware, vials, bottles.

CLASS 216.—Decorative glassware.

FURNITURE AND OBJECTS OF GENERAL USE IN CONSTRUCTION AND IN DWELLINGS.

CLASS 217.—Heavy furniture.—Chairs, tables, parlor and chamber suits, office and library furniture, vestibule furniture. Church furniture and decoration.

CLASS 218.—Table furniture.—Glass, china, silver, silver-plate, tea and coffee sets, urns, samovars, epergnes.

CLASS 219.—Mirrors, stained and enameled glass, cut and engraved window-glass, and other decorative objects.

CLASS 220.—Gilt cornices, brackets, picture frames, etc.

CLASS 221.—The nursery and its accessories; children's chairs, walking chairs.

CLASS 222.—Apparatus and fixtures for heating and cooking,—stoves, ranges, heaters, etc.

CLASS 223.—Apparatus for lighting,—gas fixtures, lamps, etc.

CLASS 224.—Kitchen and pantry,—utensils, tinware, and apparatus used in cooking (exclusive of cutlery).

CLASS 225.—Laundry appliances, washing machines, mangles, clothes-wringers, clothes-bars, ironing-tables.

CLASS 226.—Bath-room and water closet, shower bath, earth closet.

CLASS 227.—Manufactured parts of buildings,—sash, blinds, mantels, metal work, etc.

YARNS AND WOVEN GOODS OF VEGETABLE OR MINERAL MATERIALS.

CLASS 228.—Woven fabrics of mineral origin.—Wire cloths, sieve cloth, wire screens, bolting cloth.

Asbestos fibre, spun and woven, with the clothing manufactured from it.

Glass thread, floss, and fabrics.

CLASS 229.—Coarse fibres, of grass, rattan, cocoanut, and bark.

Matting, Chinese, Japanese, palm-leaf, grass, and rushes.

Floor cloths of rattan and cocoanut fibres, aloe fibre, etc.

CLASS 230.—Cotton yarns and fabrics, bleached and unbleached.

Cotton sheeting and shirting, plain and twilled.

Cotton canvas and duck. Awnings, tents.

CLASS 231.—Dyed cotton fabrics, exclusive of prints and calicoes.

CLASS 232.—Cotton prints and calicoes, including handkerchiefs, scarfs, etc.

CLASS 233.—Linen and other vegetable fabrics, uncolored or dyed.

CLASS 234.—Floor oil cloths, and other painted and enameled tissues, and imitation of leather, with a woven base.

WOVEN AND FELTED GOODS OF WOOL AND MIXTURES OF WOOL.

CLASS 235.—Card wool fabrics.—Yarns, broadcloth, doeskins, fancy cassimeres. Felted goods.

CLASS 236.—Flannels.—Plain flannels, domets, opera and fancy.

ESTABLISHED 1810.

W.A. DROWN & CO.

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UMBRELLAS
AND
PARASOLS.



TRADE-MARK.

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MAGIC LANTERNS.



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TWENTY-EIGHTH ANNUAL REPORT OF THE PENN MUTUAL LIFE INSURANCE CO.

OFFICE, 921 CHESTNUT STREET, PHILADELPHIA.

ASSETS, JAN. 1st, 1876.

United States bonds, Philadelphia and other stocks and loans, - - -	\$1,770,477 50
Mortgages and ground rents upon property appraised at \$5,334,200, all first liens, - - -	1,197,308 84
Real estate owned by Co., - - -	349,186 53
Remium notes and loans secured by collateral, - - -	853,610 13
Cash on hand and in trust companies, - - -	191,916 62
Scrip dividends held by Co., - - -	113,030 00
Balance in hand of agents, - - -	17,953 48
All other securities, - - -	236,846 14
	<hr/>
	\$5,504,329 24

LIABILITIES.

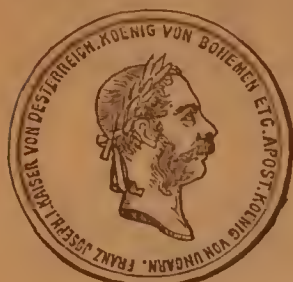
Losses reported, but not yet due, - - -	\$90,920 00
Reserve at 4 per cent interest, required to insure outstanding risks, - - -	4,553,118 00
Scrip yet outstanding, - - -	113,030 00
	<hr/>
	4,756,433 00
Surplus to policy holders, 4 per cent. basis, - - -	747,891 24
Surplus to policy holders, 4½ per cent. basis, - - -	1,083,091 24
Total number of policies issued in 1875, - - -	2,093
Policies in force Jan. 1, 1876, - - -	9,545
Amount at risk, - - -	<hr/>
	\$28,389,363 00

SAMUEL C. HUEY, President,
H. S. STEPHENS, Second Vice-President.
HENRY AUSTIE, Secretary.

SAMUEL E. STOKES, Vice-President.
JAMES WEIR MASON, Actuary.



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1125 and 1127 Chestnut St., Philadelphia.



Exhibition.



Trade Mark.

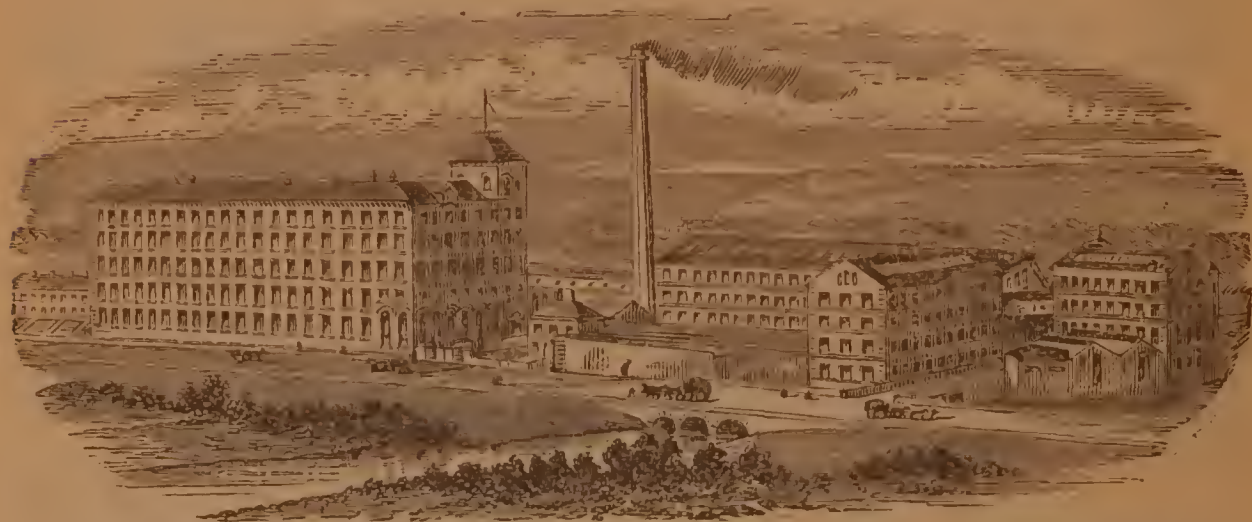


1873.

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Remarkable for its strength, pliability, evenness, and freedom from knots. It meets all the requirements of the different kinds of Sewing Machines, and is equally suitable for hand use.



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BELLE-VUE MILLS,
SKIPTON, YORKSHIRE
COTTON SPINNERS FROM A.D. 1794.

SEWING COTTON MANUFACTURERS FROM A.D. 1870.

AGENTS IN THE UNITED STATES,
MESSRS. WILSON & MERRILL, BOSTON.

CLASS 237.—Blankets, robes, and shawls.

CLASS 238.—Combined wool fabrics.—Worsted, yarns, dress goods for women's wear, delaines, serges, poplins, merinoes.

CLASS 239.—Carpets, rugs, etc.—Brussels, melton, tapestry, tapestry Brussels, Axminster, Venetian, ingrain, felted carpetings, druggets, rugs, etc.

CLASS 240.—Hair, alpaca, goat's hair, camel's hair, and other fabrics, mixed or unmixed with wool.

CLASS 241.—Printed and embossed woolen cloths, table covers, patent velvets.

SILK AND SILK FABRICS, AND MIXTURES IN WHICH SILK IS THE PREDOMINATING MATERIAL.

CLASS 242.—Cocoons and raw silk as reeled from the cocoon, thrown or twisted silks in the gum.

CLASS 243.—Thrown or twisted silks, boiled off or dyed, in hanks, skeins, or on spools.

CLASS 244.—Spun silk yarns and fabrics, and the materials from which they are made.

CLASS 245.—Plain woven silks, lustrings, sarsones, satins, serges, foulards, tissues for hat and millinery purposes, etc.

CLASS 246.—Figured silk piece goods, woven or printed. Upholstery silks, etc.

CLASS 247.—Capes, velvets, gauzes, cravats, handkerchiefs, hosiery, knit goods, laces, scarfs, ties, veils, all descriptions of cut and made up silks.

CLASS 248.—Ribbons, plain, fancy, and velvet.

CLASS 249.—Bindings, braids, cords, galloons, ladies' dress trimmings, upholsterers', tailors', military, and miscellaneous trimmings.

CLOTHING, JEWELRY, AND ORNAMENTS, TRAVELING EQUIPMENTS.

CLASS 250.—Ready-made clothing, knit goods and hosiery, military clothing, church vestments, costumes, waterproof clothing, and clothing for special objects.

CLASS 251.—Hats, caps, boots and shoes, gloves, mittens, etc., straw and palm leaf hats, bonnets, and millinery.

CLASS 252.—Laces, embroideries, and trimmings for clothing, furniture, and carriages.

CLASS 253.—Jewelry and ornaments worn upon the person.

CLASS 254.—Artificial flowers, coiffures, buttons, trimmings, pins, hooks and eyes, fans, umbrellas, sunshades, walking-canes, pipes, and small objects of dress or adornment, exclusive of jewelry. Toys and fancy articles.

CLASS 255.—Fancy leather work, pocketbooks, toilet cases, traveling equipments, valises, and trunks.

CLASS 256.—Furs.

CLASS 257.—Historical collections of costumes, national costumes.

PAPER, BLANK BOOKS, AND STATIONERY.

CLASS 258.—Stationery for the desk, stationers' articles, pens, pencils, inkstands, and other apparatus of writing and drawing.

CLASS 259.—Writing paper and envelopes, blank-book paper, bond paper, tracing paper, tracing linen, tissue paper, etc., etc.

CLASS 260.—Printing paper for books, newspapers, etc.

Wrapping paper of all grades, cartridge and manilla paper, paper bags.

CLASS 261.—Blank books; sets of account books, specimens of ruling and binding, including blanks, bill heads, etc., book binding.

CLASS 262.—Cards; playing cards, cardboard, binders' board, pasteboard, paper or cardboard boxes.

CLASS 263.—Building paper, pasteboard for walls, cane fibre felt for car-wheels, ornaments, etc.

CLASS 264.—Wall papers, enamelled and colored papers, imitations of leather, wood, etc.

MILITARY AND NAVAL ARMAMENTS, ORDNANCE, FIREARMS, AND
HUNTING APPARATUS.

- CLASS 265.—Military small-arms, muskets, pistols, and magazine guns, with their ammunition.
- CLASS 266.—Light artillery, compound guns, machine guns, mitrailleuses, etc.
- CLASS 267.—Heavy ordnance and its accessories.
- CLASS 268.—Knives, swords, spears, and dirks.
- CLASS 269.—Firearms used for sporting and hunting, also other implements for the same purpose.
- CLASS 270.—Traps for game, birds, vermin, etc.

MEDICINE, SURGERY, PROTHESIS.

- CLASS 272.—Medicines; officinal (in any authoritative pharmacopœia), articles of the materia medica, preparations, unofficinal.
- CLASS 273.—Dietetic preparations, as beef extract and other articles intended especially for the sick.
- CLASS 274.—Pharmaceutical apparatus.
- CLASS 275.—Instruments for physical diagnosis, clinical thermometers, stethoscopes, ophthalmoscopes, etc. (except clinical microscopes, etc., for which see Class 324).
- CLASS 276.—Surgical instruments and appliances, with dressings, apparatus for deformities, prothesis, obstetrical instruments.
- CLASS 277.—Dental instruments and appliances.
- CLASS 278.—Vehicles and appliances for the transportation of the sick and wounded, during peace and war, on shore or at sea.

HARDWARE, EDGE TOOLS, CUTLERY, AND METALLIC PRODUCTS.

- CLASS 280.—Hand tools and instruments used by carpenters, joiners, and for wood and stone in general. Miscellaneous hand tools used in industries, such as jewellers', engravers'.
- CLASS 281.—Cutlery, knives, penknives, scissors, razors, razor straps, skates, and implements sold by cutlers.
- CLASS 282.—Emery and sand paper, polishing powders, polishing and burnishing stones.
- CLASS 283.—Metal hollow ware, ornamental castings.
- CLASS 284.—Hardware used in construction, exclusive of tools and implements. Spikes, nails, screws, tacks, bolts, locks, latches, hinges, pulleys. Plumbers' and gas fitters' hardware, furniture fittings, ships' hardware, saddlers' hardware, and harness fittings and trimmings.

FABRICS OF VEGETABLE, ANIMAL, OR MINERAL MATERIALS.

- CLASS 285.—India rubber goods and manufactures.
- CLASS 286.—Brushes.
- CLASS 287.—Ropes, cordage.
- CLASS 288.—Flags, insignia, emblems.
- CLASS 289.—Wooden and basket ware, papier mache.
- CLASS 290.—Undertakers' furnishing goods, etc.
- CLASS 291.—Galvanized iron work.

CARRIAGES, VEHICLES, AND ACCESSORIES.

(For farm vehicles and railway carriages, see Departments of Agriculture and Machinery.)

- CLASS 292.—Pleasure carriages.
- CLASS 293.—Traveling carriages, coaches, stages, omnibuses, hearses, Bath chairs, velocipedes, baby coaches.
- CLASS 294.—Vehicles for movement of goods and heavy objects, carts, wagons, trucks.
- CLASS 295.—Sleighs, sledges, sleds, etc.
- CLASS 296.—Carriage and horse furniture, harness and saddlery, whips, spurs, horse blankets, carriage robes, rugs, etc.

UNITED STATES.

Chemicals.

Chemicals.

- 1 Gantz, Geo. F., & Co., New York, N. Y.—Baking powder. T 47. 200
- 2 Royal Baking Powder Co., New York, N. Y. T 47.
 - a Baking powder. 200
 - b Flavoring extracts, celery salt. 203
- 3 Hance Bros. & White, Philadelphia, Pa.—Solid and fluid extracts, sugar-coated pills. P 43. 200
- 4 Fries, Alex., & Bros., New York, N. Y. P 48.
 - a Chemicals, coloring, etc. 200
 - b Artificial fruit and liquor essences, flavors for cigars. 203
- 5 Gordon, W. J. M., Cincinnati, Ohio.—Chemicals, glycerine, sugar-coated pills, podophyllin, hydrastine. P 47. 200
- 6 Rosengarten & Sons, Philadelphia, Pa.—Sulphates of quinine and morphine, etc. P 41. 200
- 7 Warner, Wm. R., & Co., Philadelphia, Pa.—Sugar-coated pills and pharmaceutical preparations. P 43. 200
- 8 Campbell, Sam'l, Philadelphia, Pa. P 47.
 - a Medicinal fluid extracts. 200
 - b Perfumery and toilet articles. 203
- 9 Kreitzer, M. C., Philadelphia, Pa.—Medicines in marble show case from New Lebanon Valley quarry. T 43. 200
- 10 Keasbey & Mattison, Philadelphia, Pa.—Granular effervescent preparations, gelatine-coated pills, pharmaceutical specialties. P 43. 200
- 11 Twining & Schiedt, Philadelphia, Pa.—Fluid and solid extracts, sugar-coated pills, elixirs, concentrated preparations, chemicals, syrups, tinctures, powdered drugs. T 41. 200
- 12 Powers & Weightman, Philadelphia, Pa.—Sulphate quinia, salts of cinchona barks, sulphate morphia; chemicals medicinal, photographic, and for the arts. P 41. 200
- 13 Harrison Brothers & Co., Philadelphia, Pa.—Chemicals, alum, sugars of lead, acetates of lime, sulphuric, nitric, muriatic, acetic, and pyroligneous acids. P 41. 200
- 14 Doerr & Sloan, Philadelphia, Pa.—Lacto-phosphate of lime, iron, and cod-liver oil. T 40. 200
- 15 Mellor & Rittenhouse, Philadelphia, Pa.—Licorice and pharmaceutical extracts; glycerine composition for printers' rollers. P 41. 200
- 16 Stearns, Fred'k, Detroit, Mich.—Pharmaceutical products. P 41. 200
- 17 Dunton, Jacob, & Co., Philadelphia, Pa.—Pills. T 40. 200
- 18 Simes, Wm. F., & Son, Philadelphia, Pa.—Camphor press, sublimed and compressed camphor. P 41. 200
- 19 Tacony Chemical Works, Philadelphia, Pa.—Acids, chemical salts, etc. T 42. 200
- 20 Dreyfus, J. G., & Co., New York, N. Y.—Cream of tartar. T 43. 200
- 21 Mockridge, E., & Co., Philadelphia, Pa.—Azumea. T 47. 200
- 22 Bullock & Crenshaw, Philadelphia, Pa.—Sugar-coated pills, chemical apparatus. P 41. 200
- 23 Pennsylvania Salt Manufacturing Co., Philadelphia, Pa.—Kryolith, alum, lye, sodas, acids, chlo. calcium, and alumina. T 42. 200
- 24 Savage, Keyser, & Stovell, Philadelphia, Pa.—Acids and salts. T 44. 200
- 25 Philadelphia Quartz Co., Philadelphia, Pa.—Silicate of soda. T 45. 200
- 26 Coyne, Geo. S., Philadelphia, Pa. T 44.
 - a Acids and chemicals. 200
 - b Dyestuffs. 202
- 27 Ohio River Salt Co., Pomeroy, Ohio.—Coarse, fine, and dairy salt. T 44. 200
- 28 Condit, Hauson, & Co., Newark, N. J.—Metallic salts, electro-plating materials; hatters', dyers', jewelers', and manufacturers' chemicals. P 49. 200
- 29 Baker, H. J., & Bro., New York, N. Y.—Refined saltpetre, borax and camphor; epsom salts, castor oil. T 49. 200
- 30 Lewis, John T., & Bros., Philadelphia, Pa. T 42.
 - a Acids. 200
 - b White and red lead, litharge, orange mineral, paints, colors, and oils. 200
- 31 Silliman Chemical Works, Philadelphia, Pa.—Chemical products from tar and fine chemicals known as Fresenius's tests. P 43. 200
- 32 Wyeth, John, & Bro., Philadelphia, Pa.—Pharmaceutical preparations, drugs and compressed pills. P 41. 200
- 33 Waterloo Yeast Co., New York, N. Y.—Dry hop yeast cakes. T 47. 200
- 34 McKisson & Robbins, New York, N. Y.—Pharmaceutical preparations, oils, and drugs. P 43. 200
- 35 White, Geo. H., Jersey City, N. J.—Saccharated pepsin and cod-liver oil. T 50. 200

Chemicals, Oils, Soaps.

- 36 Kurlbaum & Co., Philadelphia, Pa.—Refined camphor and chemical preparations. P 49. 200
- 37 Crawford Bros., New York, N. Y.—Baking powder. T 47. 200
- 38 Libe, John, C., Philadelphia, Pa.—Baking yeast powder. T 47. 200
- 39 McIlvaine Brothers, Philadelphia, Pa.—Ground and powdered drugs, paints, etc. P 43. 200
- 40 Smith, Hanway, & Co., Baltimore, Md.—Baking powder. T 47. 200
- 41 Metcalf, Theo., & Co., Boston, Mass. T 49.
- a Pharmaceutical and chemical preparations. 200
- b Sachet powders, perfumery. 203
- 42 Chessman, W. H., Boston, Mass.—Pure lime from Missisquoi Lime Co., Highgate Springs, Vt. T 50. 200
- 43 Brown, Frederick, Philadelphia, Pa.—Essence of Jamaica ginger and other pharmaceutical preparations. P 41. 200
- 44 Hagner Drug Milling Co., Philadelphia, Pa.—Powdering, grinding, flaking, crushing, and other mill work. T 51. 200
- 45 Bower, Henry, Philadelphia, Pa.—Glycerine, stearic and oleic acids, prussiate of potash, sulphate of ammonia. T 43. 200
- 46 Browning & Brothers, Philadelphia, Pa. T 46.
- a Acetic acid, acetate lime, lead, alumina, and iron, sulph. copper. 200
- b Naphtha. 201
- c Dyewoods. 202
- 47 Sphinx Tooth-paste Manufacturing Co., Bethlehem, Pa.—Tooth-paste. P 49. 200
- 48 Leidy, Francis D., Philadelphia, Pa.—Soap powder, washing crystals. T 50. 200
- 49 Phillips & Jacobs, Philadelphia, Pa.—Chemicals for the arts. P 47. 200
- 50 Bean, Lewis U., Philadelphia, Pa. P 49.
- a Pharmaceutical preparations, drugs, etc. 200
- b Paints, dry and in oil. 202
- 51 Pfizer, Chas., & Co., New York, N. Y.—Pharmaceutical and chemical products: cream tartar, tartaric acid, refined borax, and camphor. P 49. 200
- 52 Preston & Merrill, Boston, Mass. P 48.
- a Yeast powder. 200
- b Sugar of lemons, flavoring extracts. 203
- 53 Meyer, Jas., jr., New York, N. Y.—Girondin disinfectant. P 49. 200
- 54 Burt, E., Philadelphia, Pa.—Insect powder, roach, and rat exterminator. T 50. 200
- 55 Billings, Clapp, & Co., Boston, Mass.—Chemicals. T 45. 200
- 56 Mackeown, Bower, Ellis, & Co., Philadelphia, Pa.—Drugs and chemicals. T 43. 200
- 57 Bailey, John T., & Co., Philadelphia, Pa.—Salt. B 68. 200
- 58 Phillips & Jacobs, Philadelphia, Pa.—Illustration of the recovery of gold and silver from wastes in the industrial arts. T 46. 200
- 59 Tilden & Co., New Lebanon, N. Y.—Fluid and solid medicinal extracts, sugar-coated pills, pharmaceutical preparations, bromo-chloralum, etc. P 43. 200
- 60 White, Chas. T., & Co., New York, N. Y.—Pharmaceutical chemicals, quinia, morphia, strychnia, iodides, bromides, acids C. P., etc. P 43. 200
- 61 United States Salicylic Acid Works, New York, N. Y.—Salicylic acid and its preparations. P 47. 200
- 62 Gray, H. Daniel, New York, N. Y.—Brimstone and flour of sulphur. T 47. 200
- 63 Follett, O. S., New York, N. Y.—White sugar of lead, chloroform, acetic acid, and vinegar. P 47. 200
- 64 King, Wm., Son, & Co., Philadelphia, Pa.—Crude and refined petroleum. T 41. 201
- 65 Pease, F. S., Buffalo, N. Y.—Natural, mineral, vegetable, and animal oils for commercial, chemical, and medicinal purposes. P 41. 201
- 66 Baker, John C., & Co., Philadelphia, Pa.—Medicinal cod-liver oil, pure and in combination with other agents. P 43. 201
- 67 Eavenson, Jones, & Sons, Philadelphia, Pa.—Laundry soaps. T 43. 201
- 68 Morgan's, Enoch, Sons, New York, N. Y.—Sapolio for cleaning and polishing, hand sapolio for toilet. T 48. 201
- 69 Cragin, I. S., & Co., Philadelphia, Pa.—Dobbins' electric soap and materials used in its manufacture. P 47. 201
- 70 Wrigley, Wm., & Co., Philadelphia, Pa.—Mineral scouring soap. T 44. 201
- 71 McKeone, Van Haagen, & Co., Philadelphia, Pa.—Soaps, oils, perfumery, soap stock, candles. T 39. 201
- 72 Conway, Wm., Philadelphia, Pa.—Laundry soaps. T 49. 201
- 73 Marx & Rawolle, New York, N. Y. T 40.
- a Glycerine. 201
- b Lacquers and French varnishes, bleached and refined gum shellac, sealing wax. 202
- 74 Gest & Atkinson, Cincinnati, Ohio.—Lard, tallow, grease; lubricating, burning, and paint oils, car candles. T 39. 201
- 75 Loper & Doughten, Philadelphia, Pa.—Naval stores. T 43. 201
- 76 Faller, Geo. J., Philadelphia, Pa.—Sewing machine oils. T 44. 201
- 77 Dreydoppel, Wm., Philadelphia, Pa.—Borax soap. T 50. 201
- 78 Central Soap Co., Canton, Ohio.—Levigated toilet and other powdered soaps. T 50. 201
- 79 Page, Kidder, & Fletcher, New York, N. Y.—Coal tar products and their uses. T 42. 201
- 80 Aladdin Oil Co., Pittsburgh, Pa.—Illuminating and lubricating oils, paraffine, etc. T 43. 201
- 81 Robinson Bros. & Co., Boston, Mass.—Toilet soaps, silver soap. P 47. 201
- 82 Williams, J. B., & Co., Glastenbury, Conn.—Soaps. P 47. 201
- 83 Brown, Robt. B., & Co., St. Louis, Mo.—Castor oil. T 50. 201

Soaps, Oils, Paints, Pigments.

- 84 Allen Hay Co., New York, N. Y.—Laundry and toilet soaps, candles, refined tallows, and animal oils. T 48. 201
- 85 Brown, Warren, Flint, Mich.—Polishing powder, mineral soap, tooth powder. P 49. 201
- 86 Moorehouse, C. L., & Son, Cleveland, Ohio.—Oils. T 43. 201
- 87 Hartmann, Laist, & Co., Cincinnati, Ohio.—Glycerine. T 50. 201
- 88 Crew, Moore, & Levick, Philadelphia, Pa.—Illuminating and lubricating oils. T 46. 201
- 89 Pratt, Chas., & Co., New York, N. Y.—Petroleum and its products, and packages for same. T 43. 201
- 90 Miller, Edward, & Co., Meriden, Conn.—Machine oils. N 48. 201
- 91 Smith, Chas. K., & Co., Philadelphia, Pa.—Burning and lubricating petroleum oils, miners' and railroad oils. T 43. 201
- 92 Nye, Wm. F., New Bedford, Mass.—Sewing machine, watch, and clock oils. T 49. 201
- 93 Houghton, E. F., & Co., Philadelphia, Pa.—Cosmoline for medical purposes, cylinder and machinery oils, hydrocarbonated bone black. T 42. 201
- 94 Boyé, M. N., & Lewis, Geo. T., Philadelphia, Pa.—Cottonseed oil, manufactured and refined. T 50. 201
- 95 Harkness, N. W., Philadelphia, Pa.—Refined petroleum, naphtha, residuum, natural lubricating oils, Harkness wells, W. Va., filtering apparatus. T 43. 201
- 96 Doan, W. H.,—Cleveland, Ohio. T 44.
 a Refined illuminating oils, naphthas, and gasolines. 201
 b Varnishes and paint dryers. 202
- 97 Devoe Manufacturing Co., New York, N. Y.—Cans with Devoe's faucet nozzle top, and samples of oil. T 40. 201
- 98 Day & Frick, Philadelphia, Pa.—Laundry soap, polishes for cleaning paint, metal, etc. T 46. 201
- 99 Dodd, A. W., & Co., Gloucester, Mass.—Cod-liver oil. P 47. 201
- 100 Warden & Oxnard, Pittsburgh, Pa.—Refined petroleum. T 49. 201
- 101 Oleophene Oil Co., New York, N. Y.—Refined petroleum illuminating oils. T 44. 201
- 102 Munger, John W., Portland, Me.—Detergent compound. P 49. 201
- 103 King, Wm., Son & Co. Philadelphia, Pa.—Oils, crude and refined petroleum. T 41. 201
- 104 Detroit Polish Co., Detroit, Mich. T 57.
 a Diamond corundum soap. 201
 b Dentrifice. 203
- 105 Rush & Co., Philadelphia, Pa.—Oils. T 41. 201
- 106 West, C., & Sons, Baltimore, Md.—Refined petroleum oil. T 41. 201
- 107 Miller, William P., & Co., New York, N. Y.—Bodeker's lubricants. T 49. 201
- 108 Galena Oil Works, Franklin, Pa.—Lubricating oil. P 43. 201
- 109 Bassett, George A., Washington City, D. C.—Liquid laundry gloss. F 71. 201
- 110 Todd, A. M., Nottawa, Mich.—Oil of peppermint. P 47. 201
- 111 Cook, Caleb, Provincetown, Mass.—Watch and clock oil. T 50. 201
- 112 Dixon Crucible Co., Jersey City, N. J.—Graphite paint. P 72. 202
- 113 Hover, J. E., & Co., Philadelphia, Pa.—Chemical writing fluid, black ink, carmine, violet, and copying inks, mucilage. T 47. 202
- 114 Wetherill & Bro., Philadelphia, Pa.—White and red lead, litharge, orange mineral. T 44. 202
- 115 Lucas, John, & Co., Philadelphia, Pa.—White lead, white zinc, colors, paints, varnishes, Swiss and imperial French greens, etc. T 45. 202
- 116 Eastman & Brooke, Philadelphia, Pa.—Soaps, washing blue, Russian dressing, and French blacking. P 47. 202
- 117 Bihn & Co., Philadelphia, Pa.—Lampblack. T 40. 202
- 118 Harrison Brothers & Co., Philadelphia, Pa.—White lead, dry and in oil, colors for painters, lithographers, and calico printing. P 41. 202
- 119 Dougherty, D. A., Kittanning, Pa.—Writing fluid. T 47. 202
- 120 Felton, Rau, & Sibley, Philadelphia, Pa.—Coach, furniture, and japan varnishes. T 40. 202
- 121 Reynolds, C. T., & Co., New York, N. Y.—Paints, colors, varnishes, and japans; artists' and wax flower materials. P 42. 202
- 122 Keystone Paint Co., Muncy, Pa.—Filler for coach, car, and safe painting, paint for school-house black-boards. T 40. 202
- 123 Carter, Dinsmore, & Co., Boston, Mass.—Writing fluid, inks, and mucilage, Lombard's inks and mucilage. T 47. 202
- 124 Fromherz, Jos., Cincinnati, Ohio.—Inks. T 47. 202
- 125 Heller & Merz, New York, N. Y.—Ultramarine. T 41. 202
- 126 Rosenberg, D., & Sons, New York, N. Y.—Varnishes and baking japans. T 44. 202
- 127 Ware, M. J., Philadelphia, Pa.—Ostrich feathers, dyed and scoured. P 47. 202
- 128 McIlvaine, Chas., & Co., Philadelphia, Pa.—Printers' copyable inks, samples of printing and copies. T 47. 202
- 129 Pecora Paint Company, Philadelphia, Pa.—Paints, stains, fillers, and dryers. T 41. 202
- 130 Davids, Thad., & Co., New York, N. Y.—Writing inks and fluid, mucilage, sealing wax, notarial seals, wafers, etc. T 47. 202
- 131 Gilpin & Prunier, Philadelphia, Pa.—Nutmeg substitute, carmine, extract of indigo, picric acid, orceine. P 47. 202
- 132 Raynald, John, Philadelphia, Pa.—Black and colored writing inks, copying inks, mucilage, hair dye, indelible ink. T 47. 202
- 133 Iron Clad Paint Co., Cleveland, Ohio.—Paints. T 41. 202

Paints, Dyes, Inks, Perfumery.

- 134 Phillips, C. C., & Co., Philadelphia, Pa.—Varnish and japans. T 41. 202
- 135 Allen, Jas. M., Co., New York, N. Y.—Sign painters' smalts, carmine ink. T 43. 202
- 136 Martin, L., & Co., Philadelphia, Pa.—Lampblack. T 41. 202
- 137 Barker, Moore, & Mein, Philadelphia, Pa.—White lead. T 40. 202
- 138 Parsons, John, New York, N. Y.—Glove powder, Dixon's silver powder, carmine and violet inks, pocket mucilage. T 47. 202
- 139 Knowlton, J. J., San Francisco, Cal.—Writing inks and mucilage. T 47. 202
- 140 Thompson, Albert, Bridgewater, Conn.—American sienna paint. T 40. 202
- 141 Sharpless, John M., & Co., Philadelphia, Pa.—Solid and liquid extract logwood. T 46. 202
- 142 Polychroite Veneer Co., Philadelphia, Pa.—Wood fibre composition for decorating wood and other surfaces. P 57. 202
- 143 Mathers', Geo., Sons, New York, N. Y.—Type and lithographic printing inks. T 47. 202
- 144 Meyers, Simon S., Philadelphia, Pa.—Stove polish, liquid bluing in ejecting bottles. T 47. 202
- 145 Valentine & Co., New York, N. Y.—Varnishes, etc., for fine coach and car work. T 43. 202
- 146 Rubber Paint Co., Cleveland, Ohio.—Waterproof house and vessel paint. T 40. 202
- 147 Masury, J. W., & Son, New York, N. Y.—Grained doors, showing graining colors; superfine colors for coach, carriage, and car painting. T 41. 202
- 148 Moss, Geo. A., New York, N. Y.—Liquid bluing, powder blue, shoe blacking, ladies' shoe dressing, writing inks, etc. T 47. 202
- 149 Adams White Lead Co., Baltimore, Md.—White lead and products. T 40. 202
- 150 Smith, Edward, & Co., New York, N. Y.—Coach and car varnishes and japan dryers. T 40. 202
- 151 United States Manufacturing Co., New York, N. Y.—Inks, mucilage, bluing, hair restorer, waterproof writing ink. T 47. 202
- 152 Moser, Chas., & Co., Cincinnati, Ohio.—Colors, dry and pulp, paints in oil, coach colors, artists' colors. T 41. 202
- 153 Wright, J. K., & Co., Philadelphia, Pa.—Printers' and lithographers' inks and varnishes. T 47. 202
- 154 Continental Manufacturing Co., Philadelphia, Pa.—Inks, writing fluids, mucilage, artists' colors. T 47. 202
- 155 McCloskey, Bro., & Co., Philadelphia, Pa.—Paints and colors ground in oil, dry, and in pulp. T 40. 202
- 156 Erwin, H., & Co., Bethlehem, Pa.—Mineral paint from Lehigh valley. T 40. 202
- 157 Princess Metallic Paint Co., Parryville, Pa.—Metallic paint and foundry facings. T 50. 202
- 158 Johnson, Chas. Eneu, & Co., Philadelphia, Pa.—Typographic and lithographic black and colored printing inks, varnishes, etc. T 47. 202
- 159 Kelley, J. B., & Co., Boston, Mass.—Slate coating paints. T 43. 202
- 160 Maynard & Noyes, Boston, Mass.—Writing ink. T 47. 202
- 161 Estes, E. B., & Son, New York, N. Y.—Sign painters' smalts. P 46. 202
- 162 Rowland, Joseph S. C., Philadelphia, Pa.—Indelible, canceling, and copying ink, and writing fluid. T 47. 202
- 163 American Bronze Powder Manufactory, Brooklyn, N. Y.—Bronze powders. N 50. 202
- 164 Francis & Loutrel, New York, N. Y. P 74. 202
a Copyable printing inks. 202
b Composition for inking rollers. 543
- 165 Foering, Geo. W., Locust Valley, Pa.—Sancon sienna. T 50. 202
- 166 Peirce, I. Newton, Philadelphia, Pa.—Stone surface paint, colors, and samples. T 70. 202
- 167 Smith, Marshall L., Kimberton, Pa.—Silex mineral paint. T 70. 202
- 168 Marble, Jerome, & Co., Worcester, Mass.—Indigo blue dye. T 70. 202
- 169 Zinsser, Wm., & Co., New York, N. Y.—Shellac, French alcohol, copal varnishes, lacquers. P 47. 202
- 170 Thomson, J. S., New York, N. Y.—Non-erasable and other inks. T 47. 202
- 171 Shaw, Thomas Ogg, Providence, R. I.—Paint made from mineral from Wyoming Territory. T 50. 202
- 172 Johnson, Henry M., New York, N. Y.—Kalsomine and fresco paints. P 47. 202
- 173 Stimson & Babcock, Boston, Mass. P 47. 202
a Coach and car varnishes. 202
b Gum copals. 603
- 174 Tetlow, Henry, & Bro., Philadelphia, Pa.—Perfumery, bouquet and toilet soaps, fine toilet preparations, blanc illusion, etc. P 48. 203
- 175 Hotchkiss, H. G., Lyons, N. Y.—American officinal essential oils. P 47. 203
- 176 Upham, Sam'l C., Philadelphia, Pa.—Extract, cologne, Florida water. P 47. 203
- 177 Wenck & Co., New York, N. Y.—Perfumes and toilet preparations. P 47. 203
- 178 Wenck & Briesen, New York, N. Y.—Automatic parlor fountain. P 47. 203
- 179 Taylor, Alfred B., Philadelphia, Pa.—Toilet waters. P 47. 203
- 180 Sulzberger, David, Philadelphia, Pa.—Cooking extracts, fruit, and liquor flavors, fruit ethers. P 48. 203
- 181 Savournin, W. H., Philadelphia, Pa.—Lily whites, rouges, toilet powders, etc. P 47. 203
- 182 Malcom & Stevenson, Philadelphia, Pa.—Fruit flavoring extracts. P 47. 203
- 183 Paine, Schering, & Glatz, New York, N. Y.—Pure essential oils. P 47. 203

Perfumery, Toilet Articles, Explosives, Ceramics.

- 184 Woodworth, C. B., & Son, Rochester, N. Y.—Perfumery, hair oils, pomades, cosmetics, flavoring extracts, T 47. 203
- 185 Young, Ladd, & Coffin, New York, N. Y.—Perfumes, oil of cologne, California water. T 48. 203
- 186 Chesebrough Manufacturing Co., New York, N. Y.—Vaseline, pomades, cerates, ointments, perfumes, cold cream, etc. P 43. 203
- 187 Lorenz Bros., Toledo, Ohio.—Concentrated perfumes. P 47. 203
- 188 Da Costa, D. R., Philadelphia, Pa.—Tooth wash. P 48. 203
- 189 Tallmadge & Co., New York, N. Y.—Essential oils and fluid extracts. P 48. 203
- 190 Fritzsche, Schimmel, & Co., New York, N. Y.—Essential oils and artificial fruit essences. P 47. 203
- 191 Bell, R. W., & Co., Buffalo, N. Y.—Staple and toilet soaps. T 48. 203
- 192 Taylor, C. R., & Co., Philadelphia, Pa.—Toilet soaps and perfumery. P 47. 203
- 193 Blair's, H. C., Sons, Philadelphia, Pa.—Toilet articles. T 47. 203
- 194 Colgate & Co., New York, N. Y.—Fancy soaps and perfumery. P 47. 203
- 195 Watson, Rich'd H., Philadelphia, Pa.—Handkerchief extracts. P 47. 203
- 196 Hoyt, E. W., & Co., Lowell, Mass.—Cologne. P 47. 203
- 197 Read, Wm. H., Baltimore, Md.—Cologne, tooth wash, perfumeries. P 47. 203
- 198 Worsley, Thos., & Co., Philadelphia, Pa.—Toilet and fancy soaps and toilet powders. P 47. 203
- 199 Wright, R. & G. A., Philadelphia, Pa.—Extracts, cologne, cosmetics, pomades, oils, dentifrices, toilet soaps, etc. P 47. 203
- 200 Wolf Brothers & Keech, Centreville, Mich.—Essential oils. P 47. 203
- 201 Aschenbach & Miller, Philadelphia, Pa.—Flavoring extracts and perfumery. P 47. 203
- 202 Fricke, Arthur, Philadelphia, Pa.—Perfumery. P 47. 203
- 203 Burnett, Jos., & Co., Boston, Mass.—Flavoring extracts, cologne water, and other toilet articles. P 48. 203
- 204 Colton, J. W., Westfield, Mass.—Fruit and spice flavors. P 43. 203
- 205 Hale & Parshall, Lyons, N. Y.—Essential oils. P 47. 203
- 206 Atwood, Hermon W., New York, N. Y.—Cologne. P 47. 203
- 207 Mitchell, Geo. E., Lowell, Mass.—Cologne. N 53. 203
- 208 Hambleton, J., & Son, Philadelphia, Pa.—Bay rum, pomades, cosmetics, colognes, extracts, hair tonics, etc. P 43. 203
- 209 Weaver, James B., Philadelphia, Pa.—Cologne, Florida water, bay rum. T 49. 203
- 210 Barber Match Co., Akron, Ohio.—Drawing-room and sulphur matches. B 75. 204
- 211 Toy, Bickford, & Co., Simsbury, Conn.—Safety fuses. T 45. 204
- 212 Laflin & Rand Powder Co., New York, N. Y.—Gunpowder, empty packages, patent cartridges for mining, fuses, crude materials. N 62. 204
- 213 Hazard Powder Co., Hazardville, Conn.—Sporting and blasting gunpowder. H 71. 204
- 214 Willis, Aug. L., Philadelphia, Pa.—Pyrotechnic fog signals. H 71. 205

Ceramics—Pottery, Porcelain, etc.

- 215 Galloway & Graff, Philadelphia, Pa.—Terra cotta statuary, vases, tazzas, pedestals, fountains, flower pots, garden edging, etc. B 72. 206
- 216 Neukumet, Philip, Philadelphia, Pa.—Fire bricks, clay retorts, gas-house tiles, and ornamental building brick. X 56. 206
- 217 Moorhead Clay Works, Philadelphia, Pa.—Terra cotta sewer and water pipes, drain and roofing tiles, garden vases, chimney tops, and flues. (*Outside.*) 206
- 218 Harvey & Adamson, Philadelphia, Pa.—Drain and sewer pipe, garden vases, statuary, chimney tops, flues, etc. B 72. 206
- 219 Remmey, Richard C., Philadelphia, Pa.—Chemical apparatus for manufacturing acids. B 68. 206
- 220 Gossin, F., Philadelphia, Pa.—Terra cotta ware, statuary, vases, fountains, pedestals, etc. B 69. 206
- 221 Bowman, O. O., & Co., Trenton, N. J.—Terra cotta drain and sewer pipe, chimney tops and flues, garden vases and statuary. B 71. 206
- 222 Fritz, John, Philadelphia, Pa.—Terra cotta work, hanging baskets, rustic flower pots, vases, fern cases, etc. Imitation gas logs. B 69. 206
- 223 Scioto Fire Brick Co., Sciotoville, Ohio.—Fire bricks and fire clays. V 61 to 64. 206
- 224 Ambruster, John, Camden, N. J.—Pressed brick work. U 50. 206
- 225 Portland Stone Ware Co., Portland, Maine.—Drain pipe, terra cotta, etc. B 70. 206
- 226 Wood Brothers, Hartford Conn.—Drain tiles. W 53. 206
- 227 Hinvest, Robt., New York, N. Y.—Clamp and band for securing masonry, hollow brick for ventilation, chimney top. (*Outside.*) 206
- 228 Hews, A. H., & Co., North Cambridge, Mass.—Flower pots, fancy earthenware, garden vases, ferneries, battery jars, etc. B 69. 206
- 229 Hall & Son, Perth Amboy, N. J.—Brick used in chimney of New Jersey State Building. 206
- 230 Maurer & Hervier, Perth Amboy, N. J.—Tiles used in construction of the New Jersey State Building. 206
- 231 American Kaolin Co., New Garden, Pa.—Fire brick and tile. X 58. 206
- 232 Bell, W. M., Smyrna, Del.—Drain tile and pipe. Y 55. 206
- 233 Kreischer, B., and Son, Philadelphia, Pa. X 56. 206
a Fire bricks, tiles, blocks, and slabs. 206
b Clay gas retorts, furnaces, and muffles. 207

Bricks, Pottery, Porcelain, Glassware.

- 234 Hall, A., & Sons, Perth Amboy, N. J. T 57.
a Diamantine front and fire bricks. 206
b Street paving blocks. 208
c Rockingham antique and yellow ware. 210
- 235 Hicks, George C., & Co., Baltimore, Md. T 55.
a Terra cotta pipe, vase, clays, etc. 206
b Fire bricks. 207
c Tiles. 208
- 236 Walker, N. U., Wellsville, Ohio. (*Outside.*)
a Sewer pipe, terra cotta ware, chimney tops and statuary. 206
b Fire tiles, stove linings. 207
c Roofing tile. 208
- 237 State of New Jersey, by Geo. H. Cook, State geologist, New Brunswick, N. J. T 70.
a Sewer and drain pipe, fine and common pottery. 206
b Fire bricks. 207
c Stoneware. 210
d Window glass. 214
e Apothecaries' and bottle glass. 215
- 238 Dixon Crucible Co., Jersey City, N. J.—Graphite crucibles, retorts, etc. P 72. 207
- 239 McIlvaine Bros., Philadelphia, Pa.—Foundry facings. P 43. 207
- 240 Goebel, J., & Co., New York, N. Y.—Clay and clay pots. T 57. 207
- 241 Young's, Wm., Sons, Trenton, N. J.—Crockery and porcelain hardware trimmings. T 74. 209
- 242 Empire China Works, Green Point, N. Y.—Porcelain hardware and cabinet trimmings. N 70. 209
- 243 Whitmore, Robinson, & Co., Akron, Ohio.—Stoneware. B 69. 210
- 244 Carr, James, New York, N. Y.—White granite, majolica and parian ware. T 77. 210
- 245 Davis, Isaac, Trenton, N. J.—White granite and decorated crockery ware. T 75. 210
- 246 Jeffords, J. E., & Co., Philadelphia, Pa.—Yellow, Rockingham, white lined, buff-stone, majolica, and lava wares. T 77. 210
- 247 Astbury & Maddock, Trenton, N. J.—Earthenware for sanitary purposes; china and earthenware for general use. T 73. 210
- 248 Ott & Brewer, Trenton, N. J.—White granite, porcelain, and parian wares; vases, figures, table and toilet goods. T 73. 210
- 249 Rouse & Turner, Jersey City Pottery, Jersey City, N. J.—Crockery. T 76. 210
- 250 Yates, Bennett, & Allen, Trenton, N. J.—Dinner, dessert, tea, and toilet sets; crockery ware. T 77. 210
- 251 Scott, George, Cincinnati, Ohio.—Rockingham and yellow ware. T 77. 210
- 252 Brunt, Bloor, Martin, & Co., East Liverpool, Ohio.—American white granite dinner, dessert, tea, and toilet decorated ware. T 74. 210
- 253 Baggott, S. & W., East Liverpool, Ohio.—Rockingham and yellow ware. T 75. 210
- 254 American Crockery Co., Trenton, N. J.—Chamber sets and table ware of bisque, white granite, and stone china. T 73. 213
- 255 Greenwood Pottery Co., Trenton, N. J.—Ironstone china, decorated dinner and toilet sets. T 74. 213
- 256 Mercer Pottery Co., Trenton, N. J.—Plain and decorative earthenware and china. T 75. 213
- 257 Onondaga Pottery Co., Geddes, N. Y.—White granite and decorated table and toilet ware. T 77. 213
- 258 Hambleton, J., & Son, Philadelphia, Pa.—Decorated porcelain plates, pitchers, barber mugs. P 43. 213

Glass and Glassware.

- 259 Lucas, John, & Co., Philadelphia, Pa.—Window glass. T 45. 214
- 260 American Plate Glass Co., Crystal City, Mo.—Plate glass. N 52. 214
- 261 Cohansey Glass Manufacturing Co., Bridgeton, N. J. N 49.
a Cylinder window glass. 214
b Bottles, vials, and demijohns. 215
- 262 Colné, J. P., Washington, D. C.—Machinery for cutting glass table ware, optical glasses, stone, marble, etc., with mathematical precision. N 49. 214
- 263 Keantsheck, Thomas, & Stewart, Philadelphia, Pa. (*Pavilion in park.*)
a Window glass. 214
b Glass shades. 216
- 264 Diamond Glass Co., Ravenna, Ohio.—Double-thick glass from ground white sandstone, in windows of Ohio State Building. 214
- 265 Wenck & Co., New York, N. Y.—Atomizers. P 47. 215
- 266 Holzer, Wm., Philadelphia, Pa.—Druggists', chemists', philosophical, and fancy glassware. N 52. 215
- 267 Young, Ladd, & Coffin, New York, N. Y.—Perfume atomizers. T 48. 215
- 268 Pile, W. H., & Sons, Philadelphia, Pa.—Hydrometers, specific gravity bottles, graduated tubes, chemical thermometers, and analytical weights. N 50. 215
- 269 Guth, Henry, New York, N. Y.—Philosophical glass instruments. N 53. 215
- 270 Fox, H. C., & Sons, Philadelphia, Pa.—Druggists' and perfumers' glassware made from glass not containing lead. N 53. 215
- 271 Bush, Geo. H., & Co., Boston, Mass. T 49.
a Alexandra atomizers, etc. 215
b Fish isinglass and glue. 646
- 272 Whitney Bros., Glassboro, N. J.—Green and other colored glassware for druggists, chemists, etc. N 54. 218
- 273 Boston and Sandwich Glass Co., Boston, Mass.—Glassware. N 51. 216
- 274 New England Glass Co., East Cambridge, Mass.—Glassware. N 50. 216
- 275 Dobelmann, J. B., Greenpoint, N. Y.—Cut and engraved glassware. N 53. 216
- 276 Degan, Thos., Union Glass Works, Somerville, Mass.—Glass shades, monuments, and cylinders. N 51. 216

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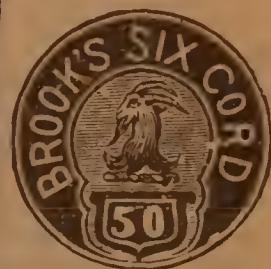


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a Cut crystal floral fountain. T 45. 216
b Crystal toilet table, prismatic candelabra, chandelier, vases, glassware. N 51. 216
- 278 La Belle Glass Co.,** Bridgeport, Ohio.—Table, bar, and lamp goods, cut and engraved ware. N 52. 216
- 279 Keystone Flint Glass Co.,** Pittsburgh, Pa.—Pure lead glass, lamp chimneys, silvered glassware. N 49 to 51. 216
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- 282 Duquesne Glass Manufacturing Co.,** Pittsburgh, Pa.—Glassware. N 49 to 51. 216
- 283 Richards & Hartley Flint Glass Co.,** Pittsburgh, Pa. Crystal glass table ware, lamps, etc. N 49 to 51. 216
- 284 Adams & Co.,** Pittsburgh, Pa.—Flint and opal glassware. N 49 to 51. 216
- 285 Atterbury & Co.,** Pittsburgh, Pa.—Lamps and glassware, gas and kerosene globes. N 49 to 51. 216
- 286 Excelsior Flint Glass Co.,** Pittsburgh, Pa.—Glass lamp chimneys, silvered glass reflectors. N 49 to 51. 216
- 287 Rochester Tumbler Co.,** Pittsburgh, Pa.—Glass tumblers. N 49 to 51. 216
- 288 Crystal Glass Co.,** Pittsburgh, Pa.—Moulded or pressed crystal glass table ware, etc. N 49 to 51. 216
- 289 Central Glass Co.,** Wheeling, W. Va.—Pressed glass ware. N 52. 216
- 290 Albertson, J. M.,** Norristown, Pa.—Window glass, glass shades, colored, obscured, and corrugated glass. N 51. 216
- Furniture and objects of General use in Construction and in Dwellings.**
- 291 Collender, H. W.,** New York, N. Y.—Billiard tables, cue-stand and marker, pool-boards and buffet. T 53. 217
- 292 Mitchell & Rammelsburg Furniture Co.,** Cincinnati, Ohio.—Rosewood bed and bureau, renaissance style; walnut dining furniture and hall stand, mediæval style. P 60. 217
- 293 Cole, Alexander,** Manumuskine, N. J. P 52.
a Iron and wood spring-bottom bedsteads. 217
b Sash fastener. 227
- 294 O'Hara, Chas. M.,** Philadelphia, Pa.—"Hygienic" chairs. P 58. 217
- 295 New York Folding Table Co.,** New York, N. Y.—Folding and adjustable tables, child's table. P 50. 217
- 296 Gardner & Co.,** New York, N. Y.—Chairs, settees, car and depot seats, etc. T 58. 217
- 297 McKinley, John,** Philadelphia, Pa.—Patent barbers' chairs. T 58. 217
- 298 Allen & Bro.,** Philadelphia, Pa.—Furniture and interior decorations. P 54. 217
- 299 Adjustable Folding Chair Co.,** Pittsburgh, Pa.—Adjustable folding chair. T 39. 217
- 300 Henkels, Geo. J.,** Philadelphia, Pa.—Chamber furniture of wood from Independence square, sofa beds. P 57. 217
- 301 Smith & Campion,** Philadelphia, Pa.—Parlor, dining-room, chamber, and library furniture. T 55. 217
- 302 Hart, Clarence A.,** Philadelphia, Pa.—Military equipments, gold fringes, etc. P 64. 217
- 303 Campbell, Wm.,** New York, N. Y.—Spring rollers for window curtains. T 52. 217
- 304 Delaware Chair Co.,** Delaware, Ohio.—Double cane-seat chairs. T 58. 217
- 305 Phelps, Doremus, & Corbett,** New York, N. Y.—Oscillating chairs, rubber springs, chair bases, and torsion spring bottoms. P 53. 217
- 306 Moore, York, & Howell,** Philadelphia, Pa.—Parlor furniture, folding tables. T 54. 217
- 307 Loth, Henry,** Philadelphia, Pa.—Folding table. P 51. 217
- 308 Ferrari, Guiseppe,** New York, N. Y.—Cabinet, richly carved in Italian style of XV century. P 58. 217
- 309 Everitt, Elisha E.,** Philadelphia, Pa.—Portable and stationary washstand and writing desk combined, sofa bed. P 56. 217
- 310 Krueger, C. F.,** Philadelphia, Pa.—Dressing table. B 74. 217
- 311 Spiral Elliptic Spring Works,** Cincinnati, Ohio.—Springs for upholstering. P 53. 217
- 312 Woven Wire Web Bed Co.,** New Britain, Conn.—Woven wire bed bottom. P 53. 217
- 313 Knell, Geo.,** Philadelphia, Pa.—Sofa bed, invalid chair and bed, rocking reclining chair, chair and lounge, photographic chairs. T 59. 217
- 314 Carrington, De Zouche, & Co.,** Philadelphia, Pa.—Interior decorations, traverse curtain fixture. P 56. 217
- 315 Sheppard, Arrison, & Sheppard,** Philadelphia, Pa.—Curtains, decorations, and upholstered furniture. P 53. 217
- 316 Marcotte, L., & Co.,** New York, N. Y.—Library (Henri II) and dining-room (Louis XIII) furniture. T 52. 217
- 317 Lever Spring Bed Co.,** Springfield, Ohio.—Spring bed. P 52. 217
- 318 Lamb, J. & R.,** New York, N. Y.—Church furniture, metal work, embroideries, and decorations. P 43. 217
- 319 Heiligmann & Bro.,** Philadelphia, Pa.—Solid wood cabinet carvings. P 57. 217
- 320 Wakefield Rattan Co.,** Boston, Mass.—Rattan furniture and ornamental ware. T 57. 217
- 321 White, Otis C.,** Hopkinton, Mass.—Stationary and portable head-rests for chairs and car-seat backs. T 59. 217
- 322 Lambie & Sargent,** New York, N. Y.—Adjustable table. P 51. 217
- 323 Herts & Co.,** New York, N. Y.—Chamber suite, carved amaranth, ebony, and maple woods; upholstery, Horsfall's dressing-case wardrobe. P 54. 217
- 324 Cutter, Ephraim,** Cambridge, Mass.—Adjustable chair for supine postures. N 58. 217

Furniture.

- 325 Kaiser & Herzog, Philadelphia, Pa.—Decorative painting for ceilings and side walls, in the modern renaissance style. P 56. 217
- 326 Steele, John, Louisville, Ky.—Folding opera chairs, church, lawn, and school seats. T 58. 217
- 327 Kimbel, A., & Cabus, J., New York, N. Y.—Parlor furniture and decorations. P 56. 217
- 328 Vaill, E. W., Worcester, Mass.—Patent folding chairs. T 57. 217
- 329 Cutler, A., & Son, Buffalo, N. Y.—Business desks, reading tables, patent automatic folding parlor tables. P 53. 217
- 330 Brautigam, N. A., New York, N. Y.—Mattress. P 53. 217
- 331 Koechling, B. H., New York, N. Y.—Opera folding chairs. P 51. 217
- 332 Seymour, H. J., Chair Co., Troy, N. Y.—Bent chairs, patent braided chairs and rockers, walnut dining and library chairs. T 58. 217
- 333 Cooper, Jas. W., & Bro., Philadelphia, Pa.—Fancy cabinet ware, wood carvings, etc. P 57. 217
- 334 Stiles, Mrs. E. W., Philadelphia, Pa.—Combination desk. P 50. 217
- 335 Karcher's, Daniel M., Sons, Philadelphia, Pa.—Sideboard. P 60. 217
- 336 Yandell & Co., Chas. R., New York, N. Y.—Leather window lambrequins, embossed wall leather hangings, leather chairs and tables. P 52. 217
- 337 Schrenkeisen, M. & H., New York, N. Y.—Upholstered rocking chair on castors. P 53. 217
- 338 Kilian Brothers, New York, N. Y.—Easels, parlor table, music stand, table, card receiver. P 51. 217
- 339 Schastez, Geo. A., New York, N. Y.—Furniture and interior decorations. P 58. 217
- 340 Brown & Bliss, New York, N. Y.—Dining-room furniture, extension tables, sideboards, etc. T 50. 217
- 341 Palmer, Theo. J., New York, N. Y.—Rocking or reclining chair on castors. P 53. 217
- 342 Kittle, S. P., New York, N. Y.—Spring mattresses and cup springs. P 52. 217
- 343 Schenck, Jas. V., New York, N. Y.—Crescent spring mattress. P 51. 217
- 344 Paton, Robt., & Son, New York, N. Y.—Church and school furniture, Sunday-school and lecture-room settees. P 54. 217
- 345 Postawka, L., & Co., Cambridgeport, Mass.—The X piano taboret. P 60. 217
- 346 Roach, J. Chandler, Philadelphia, Pa.—Spring bedstead. P 52. 217
- 347 Deetz, Edw., Philadelphia, Pa.—Adjustable sleeping apartment or retiring room. P 57. 217
- 348 Reeves & Eastburn, Philadelphia, Pa.—Folding bedstead, sofa or parlor bedstead, chamber furniture, bedstead fastening. P 56. 217
- 349 Ahrens, Geo., Crete, Ill.—Extension table. T 50. 217
- 350 Briggs, Joshua, Peterborough, N. H.—Piano stools. P 57. 217
- 351 Taylor, W. O., & Son, Bedford, Ohio.—Double cane-seat rockers and chairs. T 59. 217
- 352 United States Spring Bed Co., Springfield, Mass.—Spring beds. P 52. 217
- 353 Chormann, E. G., Philadelphia, Pa.—Parlor, sketching, and studio easels. P 50. 217
- 354 Griendling, John, Philadelphia, Pa.—Barbers' chair, foot-rest, hair dressing standard. P 51. 217
- 355 Matlack, Henry S., Philadelphia, Pa.—Paper hanging and fresco painting. P 50. 217
- 356 Berkey & Gay Furniture Co., Grand Rapids, Mich.—Chamber suite, lounges. P 59. 217
- 357 Phoenix Furniture Co., Grand Rapids, Mich.—Bed-room suites, sideboard, hall stand. P 57. 217
- 358 Wooton Desk Co., Indianapolis, Ind.—Cabinet office secretary, rotary office desk. P 52. 217
- 359 Nelson, Matter, & Co., Grand Rapids, Mich.—Chamber suits. P 58. 217
- 360 Junge, Albert, Pittsburgh, Pa.—Patent spring mattress. P 53. 217
- 361 Pabst, Daniel, Philadelphia, Pa.—Walnut sideboard. P 58. 217
- 362 Richmond, Backus, & Co., Detroit, Mich.—Combined coupon and local railroad ticket case with secretary and desk. P 58. 217
- 363 Fyler, E. W., Philadelphia, Pa.—Bedstead. P 53. 217
- 364 Torrence, Geo. N., Philadelphia, Pa.—Life-saving cork mattress. P 51. 217
- 365 Buschor, Chas., Philadelphia, Pa.—Parlor furniture, decorations, window blinds with cornice, curtains, and outside shutters, show cases. P 56. 217
- 366 Vollmer, G., Philadelphia, Pa.—Furniture. T 54. 217
- 367 Ennis, J. P., Orange, N. J.—Ladies' writing table, cradle. T 53. 217
- 368 Swasey, I. N., M. D., Yonkers, N. Y.—Billiard and trichorum tables, a new principle in carpentry, securing a permanently level surface. T 52. 217
- 369 Hover, H. F., Philadelphia, Pa.—Folding wardrobe and lounge. P 50. 217
- 370 Henkels, John A., Philadelphia, Pa.—Sideboard, extension table, dining chairs. P 57. 217
- 371 Snyder, C. Ridgway, Minneapolis, Minn.—Work table, combining lap board and writing desk. P 50. 217
- 372 Tucker Manufacturing Co., Boston, Mass.—Spring bed bottom, iron bedsteads. P 52. 217
- 373 Pottier & Stymus Manufacturing Co., New York, N. Y.—Bedstead, cabinet, bahut, table, door, door trimming, window cornice, curtains, sofa, chairs. P 55. 217
- 374 Schafft, Fridolin, Detroit, Mich.—Sideboard. P 60. 217
- 375 Ransom, D. L., Buffalo, N. Y.—Adjustable desk and business cabinet. T 59. 217
- 376 Wagan, R. M., Mount Lebanon, N. Y.—The Shakers' chairs and cushioned foot-benches. P 52. 217

Furniture, Safes.

- 377 Grant, Geo. H., & Co., Richmond, Ind.—Settees, pew ends, school desks, etc. P 54. 217
- 378 Johnson & Hamlin, Philadelphia, Pa.—Victor wire mattress. P 53. 217
- 379 Addick & Stephens, Philadelphia, Pa.—Extension table. P 51. 217
- 380 Cunningham, Peter B., Bethlehem, Pa.—Anthracite coal table, from Council Ridge coal fields, Luzerne county, Pa. T 53. 217
- 381 Fifield, J. B. M., Philadelphia, Pa.—Magic bed-sofa. T 58. 217
- 382 Lancaster, Thompson, & Co., Richmond, Ind.—Pews, pew ends, church fittings, hardwood works. P 54. 217
- 383 Poolman, James, Providence, R. I.—Extension dining table. P 51. 217
- 384 Lord, J. E., & Co., Quincy, Ill.—Spring bed bottom. P 52. 217
- 385 Goodwin, A. J., Brookline, Mass.—Sanitary bedstead. P 52. 217
- 386 Hill, Edwin P., Haverhill, Mass.—Folding table. P 50. 217
- 387 Ivins & Bro., Philadelphia, Pa.—Walnut bed. P 53. 217
- 388 Seidler & May, Hartford, Conn.—Sofa-bed. P 51. 217
- 389 Hopper, C. C., Philadelphia, Pa.—Chamber furniture. P 57. 217
- 390 Hale & Co., New York, N. Y.—Furniture and chairs. T 59. 217
- 391 Coburn Manufacturing Co., Philadelphia, Pa.—Canopy wardrobe and wardrobe arm. P 51. 217
- 392 Rhoner, Frank, & Co., New York, N. Y.—Reclining chairs. P 53. 217
- 393 Close, Thos. J., Philadelphia, Pa.—Reversible settees. N 63. 217
- 394 Walraven, J. E., Philadelphia, Pa.—Room decorations and furniture. T 60. 217
- 395 De Bock, Matthew, South Boston, Mass.—Cabinet, work table, and frame. P 51. 217
- 396 Paine's Furniture Manufactory, Boston, Mass.—Pulpit and church furniture, case of designs. T 60. 217
- 397 The J. M. Brunswick & Balke Co., Chicago, Ill.—Billiard tables and materials. T 51. 217
- 398 Collins & Sturgeon, New York, N. Y.—Reclining chair. T 53. 217
- 399 Ellin, Robt., & Co., New York, N. Y.—Eagle lecturn carved in oak, sideboard, font, hall chairs, and litany desk. P 52. 217
- 400 Morse, L., & Son, Athol, Mass.—Folding settee. P 51. 217
- 401 Hartshorn, Stewart, New York, N. Y.—Window-shade rollers. T 51. 217
- 402 Glenn, Frank, Philadelphia, Pa.—American buffet. B 41 to 44. 217
- 403 Walter Heywood Chair Co., Fitchburg, Mass.—Chairs. W 49. 217
- 404 Whitney Manufacturing Co., South Ashburnham, Mass.—Chairs. V 49. 217
- 405 Samis, L. H., Gardner, Mass.—Cane-seat chairs. W 52. 217
- 406 Thompson, Perley, & Waite, Baldwinville, Mass.—Cane-seat chairs, flexible seating. W 52. 217
- 407 Wright, Moore, & Co., South Gardner, Mass.—Cane and wood seat chairs. V 52. 217
- 408 Heywood Brothers & Co., Gardner, Mass.—Cane and wood seat and rattan chairs, rattan furniture, chair cane, reeds, etc. W 50. 217
- 409 Winchester, George C., Ashburnham, Mass.—Cane and wood seat chairs. V 50. 217
- 410 Derby, Philander, Gardner, Mass.—Cane-seat chairs. W 51. 217
- 411 Rath, Paul, New York, N. Y.—Bay-window curtain, screen, and pedestal. P 41. 217
- 412 Watson, J., & Son, Philadelphia, Pa.—Safes, ladies' jewelry stand. H 72. 217
- 413 Halls Safe and Lock Co., Cincinnati, Ohio.—Fire, burglar, and fire and burglar proof safes, deposit vaults. H 67. 217
- 414 Herring & Co., New York, N. Y.—Safes. H 69. 217
- 415 Farrel & Co., Philadelphia, Pa.—Fire and burglar proof safes. H 67. 217
- 416 Terwilliger & Co., New York, N. Y.—Fire and burglar proof safes. H 72. 217
- 417 Corliss Safe Co., Providence, R. I.—Burglar proof safes. H 67. 217
- 418 Valentine & Butler Safe and Lock Co., New York, N. Y.—Burglar and fire proof safes. H 70. 217
- 419 Mosler Safe and Lock Co., Cincinnati, Ohio.—Fire proof and fire and burglar proof safes, bank vaults, etc. H 69. 217
- 420 Skinner, Taber, Philadelphia, Pa. P 50. 217
- a Extension table. 217
- b Safety oil fixture and burner, lamp. 223
- 421 Thiery, Adolph, Philadelphia, Pa. P 51. 217
- a Tables. 217
- b Mirrors. 219
- 422 Dubernet, L., New York, N. Y. P 52. 217
- a Bamboo and fancy fire-gilt furniture. 217
- b Paper, velvet, metal, and gilt frames. 220
- 423 Speth, K. L., New York, N. Y. P 53. 217
- a Fancy cabinet ware. 217
- b Carvings, easels, pedestals, brackets, mosaic veneer, etc. 220
- 424 Earle, Jas. S., & Co., Philadelphia, Pa. P 49. 217
- a Gilt tables. 217
- b Framed looking glasses, Venetian mirrors. 219
- c Picture frames, brackets. 220
- 425 Lowe, A. C., Philadelphia, Pa. P 50. 217
- a Gilt bouquet tables. 217
- b Looking glasses. 219
- c Picture frames. 220
- 426 Hale, Kilburn, & Co., Philadelphia, Pa. P 55. 217
- a Folding bed and crib, flexible seat chairs, spring beds. 217
- b Looking glasses. 219
- c Picture frames. 220
- 427 McClees, J. E., & Son, Philadelphia, Pa. T 49. 217
- a Gilt chairs and tables. 217
- b Mirrors. 219
- c Fancy frames. 220

Furniture, Table Furniture.

- 428 Salter, Jno. G., Philadelphia, Pa.
P 50.
a Console tables. 217
b Mirrors. 219
c Cornices, portrait frames. 220
- 429 Reukauff, Geo. C., Philadelphia, Pa. P 52.
a Bouquet tables. 217
b Mirrors. 219
c Cornices, picture frames. 220
d Mantel piece. 227
- 430 Tiffany & Co., New York, N. Y.—Silver, and plated ware, incrustations of metals. N 41. 218
- 431 Bailey & Co., Philadelphia, Pa.—Silver ware. N 43. 218
- 432 Caldwell, J. E., & Co., Philadelphia, Pa.—Silverware. N 41. 218
- 433 Meriden Britannia Co., West Meriden, Conn.—Plated ware, bronzes, etc. N 43. 218
- 434 Derby Silver Co., Derby, Conn.—Hard metal silver plated table cutlery and morocco cased plated goods. P 47. 218
- 435 Derby Silver Co., Derby, Conn.—Silver-plated table ware. P 47. 218
- 436 Krider, Peter L., Philadelphia, Pa.—Sterling silver ware. P 43. 218
- 437 Reed and Barton, Taunton, Mass.—Electro-plated nickel, silver and white metal table and presentation ware. N 47. 218
- 438 Ledig, A., & Son, Philadelphia, Pa.—Silver and nickel plated ware in hard metal. P 43. 218
- 439 Middletown Plate Co., Middletown, Conn.—Silver-plated ware. N 43. 218
- 440 Gorham Manufacturing Co., Providence, R. I.—Silverware, fine plated ware, plate chests, silver and jewelry cases. N 41. 218
- 441 Manning, Bowman, & Co., West Meriden, Conn.—Nickel-plated ware. N 69. 218
- 442 Kann & Sons Manufacturing Co., Baltimore, Md.—Albata and britannia tea and table spoons. P 43. 218
- 443 Robbins, Clark, & Biddle, Philadelphia, Pa.—Silverware. N 43. 218
- 444 Meriden Silver Plate Co., West Meriden, Conn.—Silver-plated and fine cut glass ware. N 43. 218
- 445 Holmes, Booth, & Haydens, Waterbury, Conn.—Silver-plated ware. T 61. 218
- 446 Brown & Brothers, Waterbury, Conn.—German silver-plated goods. N 71. 218
- 447 Mix, G. I., & Co., Yalesville, Conn.—Tea and table spoons; planished and britannia tea and coffee pots, water coolers, etc. N 71. 218
- 448 Hall, Elton, & Co., Wallingford, Conn.—Electo-plated tableware, spoons, forks, ladles, knives, etc. P 43. 218
- 449 Sigler, C. & J., Paterson, N. J.—Embossed glass signs and table tops, glass letters, carved wood signs. T 49. 219
- 450 Walker Glass Importing, Silvering, and Manufacturing Co., New York, N. Y.—Venetian or crystal cut, engraved, distorting, and toilet mirrors. N 54. 219
- 451 Florence Manufacturing Co., Florence, Mass.—Hand mirrors. B 70. 219
- 452 Newman, Geo. C., Philadelphia, Pa. P 51.
a Looking glasses. 219
b Gilt and lacquered mouldings and ornaments for picture frames. 220
- 453 Faser, Christian, Philadelphia, Pa. P 49.
a Looking glasses. 219
b Picture frames. 220
- 454 Shaw, J. H., & Co., Philadelphia, Pa. P 52.
a Looking glasses. 219
b Picture frames, mouldings. 220
- 455 Boland, Fred., Philadelphia, Pa. P 50.
a Looking glasses. 219
b Pier cornices, picture frames. 220
c Mantels. 227
- 456 Hall & Garrison, Philadelphia, Pa. P 50.
a Mirrors. 219
b Frames, pier frames, etc. 220
c Mantel, mouldings, door and frame, window. 227
- 457 Clark, C. W., Philadelphia, Pa.—Window shades, window shade cloth, and shade fixtures. T 52. 220
- 458 Johnston, Ed. S., Philadelphia, Pa.—Window shade rollers, window shades, lambrequins, cornices. T 53. 220
- 459 Gleason, W. B., & Co., Boston, Mass.—Artificial wood ornaments for interior decoration, etc. P 75. 220
- 460 Goff, R. W. P., Philadelphia, Pa.—Fancy cabinet ware. P 58. 220
- 461 Reifschneider, Felix, New York, N. Y.—Velvet frames, morocco and velvet miniature cases. P 52. 220
- 462 Pape, Bros., & Kügemann, Cincinnati, Ohio.—Mouldings for picture frames, portrait and photograph frames. P 51. 220
- 463 Carter, A. A., Philadelphia, Pa.—Window screens. T 50. 220
- 464 Whittier, Reuben S., Hyde Park, Mass.—Window screen and mosquito bar. T 51. 220
- 465 Kilgore, Damon Y., Philadelphia, Pa.—Upside window blinds. T 51. 220
- 466 McKay, Ferd. C. D., Paterson, N. J.—Self-acting shade rollers. T 51. 220
- 467 Cook, Wm. A., Newark, N. J.—Window shades and patent spring rollers. T 51. 220
- 468 Salem Shade Roller Manufacturing Co., Salem, Mass.—Control wood rollers, flying pawls, automatic stops for balance rollers. T 50. 220
- 469 Colwell, F. E., & Co., Chicago, Ill.—Mouldings and picture frames, shade fixtures. P 51. 220
- 470 Louderback, Edwin, Philadelphia, Pa.—Rustic window shades of wood. T 49. 220
- 471 Defreune, H. J., Green Bay, Wis.—Window rolling blinds. T 51. 220
- 472 Lloyd Bros., Philadelphia, Pa.—Ventilating shade fixtures. T 50. 220
- 473 American Shade Roller Co., Boston, Mass.—Shade rollers, window shades, and fixtures. T 51. 220

Nursery Furniture, Lighting Apparatus, Kitchen Ware.

- 474 Hewett, William, Philadelphia, Pa.—Self-operating swing carriage for parks and lawns. (*Outside.*) 221
- 475 Beaudet, Homer J., Greenpoint, Long Island, N. Y.—Swing convertible cradle. P 51. 221
- 476 Batley, John, Philadelphia, Pa.—Child's cradle or crib. P 51. 221
- 477 Rusk, Thos. J., Philadelphia, Pa.—Swing. (*In Park.*) 221
- 478 Providence Gas-burner Co., Providence, R. I. P 47. 222
a Gas heaters. 222
b Gas-burners, drop-light sockets, etc. 223
- 479 Thackara, Buck, & Co., Philadelphia, Pa.—Gas fixtures, chandeliers, brackets, hall lights, reading lights, etc. N 60. 223
- 480 Cornelius & Sons, Philadelphia, Pa.—Gas fixtures, bronzes, etc. N 47. 223
- 481 Bartlett, Jos. W., New York, N. Y.—Crystal and reflecting street lamps. N 50 and P 49. 223
- 482 Archer & Pancoast Manufacturing Co., New York, N. Y.—Gasoliers, centre slide chandeliers, ornamental bronzes, ecclesiastical metal work. N 47. 223
- 483 American Reflector Co., Philadelphia, Pa.—Gas and daylight reflectors, lanterns and shades. P 47. 223
- 484 Tucker, Hiram, & Co., Boston, Mass.—Iron gas chandeliers, brackets and statuettes. N 47. 223
- 485 Willheim & Newman, Philadelphia, Pa.—Cast iron posts and brackets, street lanterns, mica reflectors, and car trimmings. N 48. 223
- 486 Quarré, V., & Co., Philadelphia, Pa.—Gas and lamp shades, transparent window pictures. N 48. 223
- 487 Baker, Arnold, & Co., Philadelphia, Pa.—Gas fixtures. N 48. 223
- 488 Miner, Jacob G., New York, N. Y.—Street lamps for gas or oil. P 47. 223
- 489 Wilhelm, August, Philadelphia, Pa.—Ceiling reflectors. P 47. 223
- 490 Bradley & Hubbard, Manufacturing Co., West Meriden, Conn.—Kerosene chandeliers, brackets, and fixtures, lamps. N 47. 223
- 491 Kramer, J. H., New York, N. Y.—Ornamental lanterns. P 47. 223
- 492 Walton Bros., New York, N. Y.—Railroad and steamship brass lanterns and supplies. P 47. 223
- 493 Dyott, M. B., Philadelphia, Pa.—Street lamps, brackets, posts, pendants, and lamp goods. P 48. 223
- 494 Miller, Edward, & Co., Meriden, Conn.—Bronze lamps and ornaments, lamp trimmings. N 48. 223
- 495 Hitchcock Lamp Co., Watertown, N. Y.—Lamps for fat oils and kerosene. P 47. 223
- 496 Dreer, Smith, & Dreer, Philadelphia, Pa.—Berford gas sunlight apparatus. P 47. 223
- 497 Atterbury & Co., Pittsburgh, Pa.—Lamps. N 49 to 51. 223
- 498 Parkhurst, V. P., East Templeton, Mass.—Candle stand with flame regulator. P 47. 223
- 499 Williams, Page, & Co., Boston, Mass.—Railway and steamship lamps. P 47. 223
- 500 Hale, A. W., New York, N. Y.—Flexible gas tube. P 47. 223
- 501 Mitchell, Vance, & Co., New York, N. Y.—Gas fixtures. N 49. 223
- 502 Ives Patent Lamp Co., New York, N. Y.—Kerosene lamps, brackets, chandeliers, and pendants, burners and attachments. P 47. 223
- 503 Stockwell Self-lighting Gas Burner Co., New York, N. Y.—Self-lighting gas burner. P 50. 223
- 504 Wiler, Wm., Philadelphia, Pa.—Taper holders, gas torches, and keys, etc. N 71. 223
- 505 Cleveland Non-explosive Lamp Co., Ohio.—Chandeliers, pendants, brackets, kerosene safety lamps. N 64. 223
- 506 Wallace & Sons, Ansonia, Conn.—Lamp burners. P 68. 223
- 507 The Maine Manufacturing Co., New York, N. Y.—Lamps. N 65. 223
- 508 Doty, H. H., Washington, D. C.—Concentric mineral oil burner. N 50. 223
- 509 Lovell, F. H., & Co., New York, N. Y.—Kerosene burners, chimneys, wicks, lamps, etc. P 50. 223
- 510 United States Soapstone Manufacturing Co., Cincinnati, Ohio. P 77. 223
a Lava gas tips. 223
b Soapstone griddles. 224
- 511 Gale, D. A. T., Syracuse City, N. Y.—Automatic roaster and popper, with attachment. P 50. 224
- 512 Cohansey Glass Manufacturing Co., Bridgeton, N. J.—Fruit jars. N 49. 224
- 513 Lowentrant, P., Newark, N. J.—House furnishing goods. N 70. 224
- 514 Vulcan Manufacturing Co., New York, N. Y.—Meat cutters and stuffers. N 71. 224
- 515 Lowerre & Tucker, Newark, N. J.—Fluting machines. N 71. 225
- 516 Sam'l Wilkins & Orcutt Manufacturing Co., New York, N. Y.—Gas heated toilet sad-irons. P 68. 225
- 517 Lloyd, Supplee, & Walton, Philadelphia, Pa.—Fluting machines. P 70. 225
- 518 Boughton, Jno. W., Philadelphia, Pa.—Wood carpet, parquet floors, and wainscots, adjustable window screens and bars. T 56. 227
- 519 National Wood Manufacturing Co., New York, N. Y.—Wood carpeting, parquet and inlaid floors, ornamental hardwood ceilings, fancy wainscoting, and stair coverings. P 52. 227
- 520 Johns, H. W., New York, N. Y.—Asbestos roofing, sheathing, and lining felts. P 47. 227
- 521 Ehret, M., jr., Philadelphia, Pa.—Pavilion to exhibit granulated composition roofing. (*Outside.*) 227
- 522 Marion Blind Co., Brady, Pa.—Improved window blinds. T 53. 227
- 523 Walker, M., & Sons, Philadelphia, Pa.—Heavy wrought iron gates at north, south, east, and west entrance of Main Exhibition Building. 227

Parts of Buildings, Woven Goods.

- 524 Fisher & Bird, New York, N. Y.—Marble mantels, tablet, marble wainscoting. T 50. 227
- 525 Geddes, J. W., Baltimore, Md.—Skylight over south aisle. 227
- 526 American Inlaid Wood Co., Cleveland, Ohio.—Inlaid wood floor. (*Ladies' parlor, Ohio State Building.*) 227
- 527 Garry Iron Roofing Co., Cleveland, Ohio.—Sections of corrugated iron roof. (*Ohio State Building.*) 227
- 528 American Sheet and Boiler Plate Co., Cleveland, Ohio.—Section iron roofing tile. (*Ohio State Building.*) 227
- 529 House & Davidson, Cleveland, Ohio.—Pair front doors. (*Ohio State Building.*) 227
- 530 Dobbins, R. J., Philadelphia, Pa.—Construction of Main Exhibition Building. 227
- 531 Quigley, Philip, Wilmington, Del.—Construction of Machinery Hall. 227
- Yarns and Woven Goods of Vegetable or Mineral Materials.**
- 532 De Witt, G., Bro. & Co., Belleville, N. J.—Wire cord, rope, cloth, and work, dandy roll, cotton and wire fabrics. B 76. 228
- 533 Clinton Wire Cloth Co., Clinton, Mass.—Iron railing, wire cloth, netting, fencing, fireproof lath. T 68. 228
- 534 Macready, H. A., Philadelphia, Pa.—Brass wire cloth for paper makers' use. B 77. 228
- 535 Woven Wire Mattress Co., Hartford, Conn.—Woven wire cloth used for a spring bed. P 53. 228
- 536 Wild, Jos., & Co., New York, N. Y.—Matting and mats of fibre of cocoanut husks. N 77. 229
- 537 Wakefield Rattan Co., Boston, Mass.—Mats and matting. T 57. 229
- 538 Irving Bros., Philadelphia, Pa.—Japanese paper carpeting, waterproof building paper. N 75. 229
- 539 Garsed Bros., Frankford, Pa.—Awnings and tickings. N 74. 230
- 540 Farnum, John, & Co., Philadelphia, Pa.—Tickings from Conestoga steam mills, Lancaster, Pa. N 75. 230
- 541 Bailey, John T., & Co., Philadelphia, Pa.—Bags. B 68. 230
- 542 Thornton, Samuel, & Sons, Philadelphia, Pa.—Cotton fabrics. N 76. 230
- 543 Berkeley Co., Providence, R. I.—Cambrics, nainsooks, and lawns of Sea Island and Egyptian cotton. N 75. 230
- 544 Clark Thread Co., Newark, N. J.—Spool cotton. N 76. 230
- 545 Emory Johnson, Neptune Twine Mills, Moodus, Conn.—Cotton twines, welting cord, carpet warps, knitting cotton. B 68. 230
- 546 Oakley, W. H., jr., New York, N. Y.—Carpet warp. N 75. 230
- 547 Semple, Samuel, & Sons, Mt. Holly, N. J.—Spool cotton. N 74. 230
- 548 Walcott & Campbell, New York Mills, Oneida county, N. Y.—Shirtings, wide sheetings, cottonades, and knitting yarns. N 75. 230
- 549 Schlittler, Mary A., Rahway, N. J.—Cotton wadding and batting. N 75. 230
- 550 Powhatan Mills, Providence, R. I.—Bleached and brown muslins. N 74. 230
- 551 Saratoga Victory Manufacturing Co., Boston, Mass.—Silesias, cambrics, and fancy cottons. F 73 and 74. 230
- 552 Chicopee Manufacturing Company, Chicopee Falls, Mass.—Cotton flannels, bleached and brown. F 73 and 74. 230
- 553 Great Falls Manufacturing Company, Rockingham, N. C.—Rockingham sheeting. N 75. 230
- 554 Peckham Manufacturing Company, Providence, R. I.—Kentucky jeans. B 76. 230
- 555 Androscoggin Mills, Lewiston, Maine.—Sheeting, shirting, jeans, bags, etc. R 78. 230
- 556 Hill Manufacturing Company, Lewiston, Me.—Bleached and unbleached sheetings and shirtings. R 78. 230
- 557 Continental Mills, Lewiston, Me.—Sheetings and shirtings. R 78. 230
- 558 Barker Mills, Auburn, Me.—Bleached and unbleached sheetings. R 78. 230
- 559 Smith, James Y., Manufacturing Co., Providence, R. I.—Elmwood shirting, brown and bleached. N 76. 230
- 560 Evansville Cotton Manufacturing Co., Evansville, Md.—Brown sheetings and drills, assorted yarns. N 74. 230
- 561 King Philip Mills, Fall River, Mass.—Brown and bleached sheetings, cambric muslins, and rolled jaconets. N 76. 230
- 562 Hope Company, Providence, R. I.—Shirting. N 74. 230
- 563 Lonsdale Company, Providence, R. I.—Sheetings, cambric muslin, silesias, jaconets, Victoria lawns, sateens. N 74. 230
- 564 Blackstone Manufacturing Company, Providence, R. I.—Print cloths, shirtings, umbrella cloths. N 74. 230
- 565 Gambrill, Sons & Co., Baltimore, Md.—Cotton duck for sails, tents, and awnings. D 78. 230
- 566 Wamsutta Mills, New Bedford, Mass.—Shirting and sheeting. N 74. 230
- 567 Shaw, James G., New Castle, Del.—Single carded cotton warps. N 74. 230
- 568 Riddle, Jas., Son & Co., Wilmington, Del.—Brandywine Mills tickings. N 74. 230
- 569 Wauregan Mills, Wauregan, Conn.—Cotton goods. N 74. 230
- 570 Ponemah Mills, Taftville, Conn.—Plain and fancy cotton goods. N 74. 230
- 571 Gabriel, Henry, & Sons, Allentown, Pa.—Counterpanes, bed coverlets, quilts, and bed spreads. F 68. 230
- 572 Stafford & Co., Providence, R. I.—Cotton yarns, hosiery cops, twilled goods. N 76. 230
- 573 Minot, Hooper, & Co., Boston, Mass.—Bleached cotton goods. N 73. 230

Cotton Goods.

- 574 Great Falls Manufacturing Co., Boston, Mass.—Brown and bleached cotton cloth. N 73. 230
- 575 Dwight Manufacturing Co., Boston, Mass.—Brown and bleached cotton goods. N 73. 230
- 576 Lyman Mills, Boston, Mass.—Brown and bleached cotton goods. N 73. 230
- 577 Putnam Manufacturing Co., Providence, R. I.—Colored cotton goods. N 73. 230
- 578 Clinton Manufacturing Co., Providence, R. I.—Bleached cotton goods. N 73. 230
- 579 Bridge Mill Cotton Manufacturing Co., Providence, R. I.—Bleached cotton goods. N 73. 230
- 580 Manville Co., Providence, R. I.—Cotton goods, bleached and colored. N 73. 230
- 581 Ross, John L., Providence, R. I.—Bleached, unbleached, and colored cotton goods. N 73. 230
- 582 Social Manufacturing Co., Providence, R. I.—Brown, bleached, and colored cotton goods. N 73. 230
- 583 Warren Manufacturing Co., Warren, R. I.—Bleached and colored cotton goods. N 73. 230
- 584 Peabody Mills, Providence, R. I.—Colored cotton goods. N 73. 230
- 585 Dyerville Manufacturing Co., Providence, R. I.—Brown and bleached cotton goods. N 73. 230
- 586 Ballow, Geo. C., & Son, Providence, R. I.—Brown, bleached, and colored cotton cloth. N 73. 230
- 587 Silver Spring Bleaching & Dyeing Co., Providence, R. I.—Bleaching, dyeing, and finishing the various grades and styles of cotton cloth. N 73. 230
- 588 Hooper, Wm. E., & Sons, Baltimore, Md.—Awning stripes, cotton duck. D 78. 230
- 589 Boston Manufacturing Co., Boston, Mass.—Cotton goods. B 76. 230
- 590 Cabot Manufacturing Co., Boston, Mass.—Cotton goods. B 76. 230
- 591 Gale & Co., Boston, Mass.—Tents, canopies, and clothes dryer. (*Outside.*) 230
- 592 Greene & Daniels, Pawtucket, R. I.—Ivory finish and six-cord spool cotton, gray, bleached, and dyed cotton yarns. N 76. 230
- 593 Fall River Bleachery, Fall River, Mass.—Bleached cottons, shirtings, and sheetings. N 76. 230
- 594 Lowell Bleachery, Lowell, Mass.—Bleached and colored cotton fabrics. N 73. 230
- 595 Amoskeag Manufacturing Co., Manchester, N. H.—Tickings, denims, awning stripes, cotton flannels, ginghams, fancy shirtings, jeans, shirtings, sheetings, drillings. N 74. 230
- 596 Naumkeag Steam Cotton Co., Salem, Mass.—Sateens, wide sheetings, shirtings. N 74. 230
- 597 Massachusetts Cotton Mills, Lowell, Mass.—Sheetings, shirtings, drillings, etc. N 73. 230
- 598 Tremont & Suffolk Mills, Lowell, Mass.—Brown and bleached cotton flannels, sheetings, shirtings, colored suitings, corset jeans, Suffolk drills. N 73. 230
- 599 Appleton Co., Lowell, Mass.—Unbleached sheetings and drillings. N 73. 230
- 600 Boott Cotton Mills, Lowell, Mass.—Brown and bleached cottons. N 73. 230
- 601 Shroder, F., & Co., New York, N. Y.—Brown cottons, drills, and nankcens. B 75. 230
- 602 Nashua Manufacturing Co., Nashua, N. H.—Brown and bleached cottons, cotton flannels, printings. N 77. 230
- 603 Jackson Co., Nashua, N. H.—Heavy brown cottons. N 77. 230
- 604 Ocean Mills, Nashua, N. H.—Brown and bleached cottons. N 77. 230
- 605 Shetucket Co., Norwich Conn.—Fancy stripes, denims, ducks, chevots. N 77. 230
- 606 Falls Co., Norwich Conn.—Cotton duck, fancy colored duck tickings. N 77. 230
- 607 Utica Steam Cotton Mills, New York, N. Y.—Brown and bleached sheetings. N 74. 230
- 608 Mount Vernon Co., Baltimore, Md.—Duck and sail twine. D 78. 230
- 609 Hadley Co., Boston, Mass.—Cotton yarns and warps, spool cottons, threads; harness and seine twines. N 75. 230
- 610 Union Wadding Co., Providence, R. I.—Cotton wadding, batting, and machinery waste. F 74. 230
- 611 Smith, H. E., & Co., Providence, R. I.—Cotton yarns for hosiery, shawl, and carpet manufacture. N 74. 230
- 612 Richardson, C. D., & Co., Philadelphia, Pa.—Tents. (*Outside.*) 230
- 613 Hale, B. S., & Co., Lawrence, Mass.—Fish lines. N 75. 230
- 614 Laconia Company, Biddeford, Maine.—Sheetings, shirtings, drills, and jeans. R 78. 230
- 615 Pepperill Manufacturing Co., Biddeford, Maine.—Sheetings, shirtings, drills, and jeans. R 78. 230
- 616 Otis Company, Palmer, Mass.—Denims. N 75. 230
- 617 Palmer Mills, Palmer, Mass.—Dress goods. N 75. 230
- 618 Brinckerhoff, Turner, & Co., New York, N. Y.—Duck, canvas, ravens, awning stripes, bags, twines, bunting. D 78. 230
- 619 Washington Manufacturing Co., Gloucester, N. J.—Printing cloths, etc. N 75. 230
- 620 Monument Mills, Housatonic, Mass.—Marseilles quilts. N 74. 230
- 621 Hart, A. H., & Co., New York, N. Y.—Carpet warps. B 68. 230
- 622 Monadnock Mills, Claremont, N. H.—Quilts, counterpanes, and wide sheetings. H 78 and N 74. 230
- 623 American Linen Co., Fall River, Mass.—Printing cloths. B 77. 230
- 624 Annawan Manufactory, Fall River, Mass.—Printing cloths. B 77. 230
- 625 Barnard Manufacturing Co., Fall River, Mass.—Printing cloths. B 77. 230

Cotton and Linen Goods.

- 626 Border City Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 627 Chace Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 628 Flint Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 629 Granite Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 630 Mechanics Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 631 Merchants Manufacturing Co., Fall River, Mass.—Printing cloths. B 77. 230
- 632 Metacomet Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 633 Narragansett Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 634 Osborn Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 635 Richard Borden Manufacturing Co., Fall River, Mass.—Printing cloths. B 77. 230
- 636 Sagamore Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 637 Shove Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 638 Slade Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 639 Stafford Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 640 Tecumseh Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 641 Troy Cotton and Woolen Manufactory, Fall River, Mass.—Printing cloths. B 77. 230
- 642 Wampanoag Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 643 Weetamoe Mills, Fall River, Mass.—Printing cloths. B 77. 230
- 644 Dwight Manufacturing Co., Chicopee, Mass.—Brown and bleached sheetings and shirtings. C 78. 230
- 645 Lyman Mills, Holyoke, Mass.—Brown and bleached sheetings and shirtings, drills, lawns, cambrics, etc. C 78. 230
- 646 Great Falls Manufacturing Co., Great Falls, N. H.—Bleached and brown sheetings and shirtings. C 78. 230
- 647 Schum, Philip, Lancaster, Pa.—Coverlets and counterpanes. G 78. 230
- 648 Methuen Mill, New York, N. Y.—Jute bagging. E 78. 230
- 649 Webster Mills, New York, N. Y.—Jute bagging. E 78. 230
- 650 Nevins Mill, New York, N. Y.—Jute bagging. E 78. 230
- 651 Mississippi Mills, Wesson, Miss.—Yarns, cotton, cottonades. F 76. 230
- 652 Bullock, George & James M., Conshohocken, Ohio.—Cotton warp. F 75. 230
- 653 Wortendyke Manufacturing Co., Wortendyke, N. J.—Lamp wicks and cotton yarns. N 75. 230
- 654 Moss Manufacturing Co., West-erly, R. I.—Shirtings. N 74. 230
- 655 Harris Manufacturing Co., Providence, R. I.—Bleached shirtings. N 74. 230
- 656 Clinton Manufacturing Co., Providence, R. I.—Bleached shirtings. N 74. 230
- 657 Glasgow Company, South Hadley Falls, Mass.—Ginghams, yarns. N 74. 230
- 658 Allendale Company, Providence, R. I.—Bleached shirtings and sheetings. N 74. 230
- 659 Groton Manufacturing Co., Philadelphia, Pa.—Bleached goods. N 74. 230
- 660 Franklin Manufacturing Co., Providence, R. I.—Bleached cottons. N 74. 230
- 661 Providence Steam Mills, Providence, R. I.—Bleached cottons. N 74. 230
- 662 Tucker, Carter, & Co., New York, N. Y.—Bagging. B 69. 230
- 663 Renfrew Manufacturing Co., South Adams, Mass. B 75. 230
a Cotton warps, skirtings. 230
b Ginghams. 231
c Cotton dress goods. 232
- 664 Gloucester Gingham Mills, Gloucester City, N. J. N 76. 230
a Cottonades, shirtings. 230
b Ginghams, dress goods. 231
- 665 Langdon Manufacturing Co., Manchester, N. H. N 74. 230
a Brown and bleached shirtings, bleached cottons. 230
b Colored silcias. 231
- 666 Whittenton Manufacturing Co., Taunton, Mass. N 76. 230
a Cottonades, shirtings, tickings, denims, and awnings. 230
b Dress goods and fancy checks. 231
- 667 York Manufacturing Co., Boston, Mass. N 74. 230
a Ticks, denims, light and heavy cottonades, shirtings, and skirtings. 230
b Nankins, scersuckers, and dress goods. 231
- 668 Everett Mills, Lawrence, Mass. B 73. 230
a Fancy cottons, cottonades, ticking, denims, cheviot. 230
b Stripes, ginghams, dress goods. 231
- 669 Davoll Mills, Fall River, Mass. N 76. 230
a Sheetings, pillow muslins, shirtings, silcias. 230
b Fancy cotton fabrics. 232
- 670 Hamilton Manufacturing Co., Lowell, Mass. N 73. 230
a Tickings, drillings, and canton flannels. 230
b Printed and dyed calicoes, shirting and awning stripes. 232
- 671 Holt, R., Paterson, N. J. N 74. 230
a Cotton and Turkish towels, terry cloth, dusters, etc. 230
b Linen towels. 233
- 672 Stark Mills, Manchester, N. H. N 74. 230
a Seamless bags, sheetings, and drills, over-all and double ducks. 230
b Linen crash toweling. 233
- 673 Millville Manufacturing Co., Philadelphia, Pa. E 75. 230
a Shirtings, cambrics, silcias. 230
b Printed linings, umbrella cloths, vel-lums. 231
c Window hollandes. 233



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Cotton and Linen Goods, Oil Cloths, Woolen Goods.

- 674 Bates Manufacturing Co., Lewiston, Maine. R 73.
a Shirtings, skirtings, quilts, jeans, towels, knitting cotton, etc. 230
b Ginghamis, damask, silesias. 232
c Linen checks. 233
- 675 Ripka and Elton Mills, Philadelphia, Pa.—Cotton manufactures. N 74. 231
- 676 Lancaster Mills, Clinton, Mass.—Fancy ginghamis. N 77. 231
- 677 Belfast Mills, Philadelphia, Pa.—Ginghamis. N 76. 231
- 678 Albion Print Works, Conshohocken, Pa.—Solid colors suitings, plain blacks, grays, mourning prints, shirtings, and printed articles for men. N 73. 232
- 679 Hartel, Andreas, & Co., Pennypack Print Works, Philadelphia, Pa.—Madder and fancy prints and shirtings. N 75. 232
- 680 Brown, David S., & Co., Philadelphia, Pa.—Madder fancies, shirtings and mournings from Gloucester Manufacturing Co., Gloucester, N. J.; aniline, alezarine, oil, and madder colors and shirtings from Ancona Printing Co., Gloucester, N. J. N 77. 232
- 681 Simpson, Wm., & Sons, Philadelphia, Pa.—Calico prints in mourning, fancy, and shirting styles. N 75. 232
- 682 Pretty, Grime, & Co., Philadelphia, Pa.—Calico prints. N 74. 232
- 683 Green, S. H., & Sons, Clyde Bleachery and Print Works, River Point, R. I.—Printed calicoes. N 74. 232
- 684 Richmond Manufacturing Co., Providence, R. I.—Printed calicoes. N 75. 232
- 685 Manchester Mills, Manchester, N. H.—Prints. N 73. 232
- 686 American Print Works, Fall River, Mass.—Printed calicoes. N 75. 232
- 687 Hamilton Woolen Co., Southbridge, Mass.—Prints, shirting prints, printed cambrics. N 74. 232
- 688 Merrimac Mills, Lowell, Mass.—Printed and dyed calicoes. N 73. 232
- 689 Stevens Linen Works, New York, N. Y.—Plain and twilled linen crashes and diapers. B 75. 233
- 690 Barbour Flax-spinning Co., Paterson, N. J.—Flax threads. N 76. 233
- 691 McCrossan & Farr, New York, N. Y.—Printed linen and cotton and white cotton handkerchiefs. N 76. 233
- 692 American Linoleum Manufacturing Co., New York, N. Y.—Linoleum floor cloth. N 77. 234
- 693 New York Leather Manufacturing Co., New York, N. Y.—An imitation of morocco and seal skin leathers. F 77. 234
- 694 Blabon, Geo. W., & Co., Philadelphia, Pa.—Floor, carriage, upholstery, and table oil cloths and window shades. N 77. 234
- 695 Dunn & Hunt, Philadelphia, Pa.—Floor oil cloths. N 77. 234
- 696 Violet & Durlach, Elizabeth, N. J.—Floor oil cloths. F 73. 234
- 697 Atha & Hughes, Newark, N. J.—Enameled carriage, table, and stair oiled cloth. F 77. 234
- 698 Potter, Thos., Sons & Co., Philadelphia, Pa.—Oil cloths. N 77. 234
- 699 Hyde Manufacturing Co., East Newark, N. J.—Imitation wood and marble table oil cloths. F 77. 234
- 700 Brasher, Wm. M., & Co., Brooklyn, N. Y.—Floor oil cloths. F 71. 234
- 701 Reeve, R. H., & B. C., Camden, N. J.—Oil cloths. F 71. 234
- 702 Powers, D., & Sons, New York, N. Y.—Floor oil cloths. F 77. 234
- Woven and Felted Goods of Wool and Mixture of Wool.**
- 703 Shaffner & Stringfellow, Philadelphia, Pa.—Knitting cotton and Germantown wool. B 75. 235
- 704 Bacon, Chas. N., Winchester, Mass.—Felts for polishing, printing, erasing, etc., cotton and wool wadding. N 74. 235
- 705 New England Co., Rockville, Conn.—Fancy cassimeres. B 76. 235
- 706 Philadelphia Worsted Spinners' Association, Philadelphia, Pa.—Worsted yarns. F 75. 235
- 707 Midnight Yarn Co., Philadelphia, Pa.—Woolen knitting and Germantown yarns, representing process of manufacture. B 77. 235
- 708 Thornton, Samuel, & Sons, Philadelphia, Pa.—Woolen fabrics. N 76. 235
- 709 Rockwell & Phillips, Fitchburg, Mass.—Worsted coatings and suitings. B 77. 235
- 710 Ledward, J., & Son, Chester, Delaware county, Pa.—Cassimeres and doeskins. B 76. 235
- 711 Horstmann, Wm. H., & Sons, Philadelphia, Pa.—Woolen knitting yarns. H 73. 235
- 712 Globe Woolen Co., New York, N. Y.—Fancy cassimeres. F 74. 235
- 713 Dryfoos, L., & Co., New York, N. Y.—Felt skirts, embroidered and braided, Italian cloth skirts, trimmed and quilted. C 78. 235
- 714 Worumbo Manufacturing Company, Lisbon Falls, Maine.—Moscow beaver and other overcoatings. R 78. 235
- 715 Bel Air Manufacturing Co., Pittsfield, Mass.—Fancy all-wool cassimeres. F 73. 235
- 716 Burlington Woolen Co., Winoski Fall, Vt.—Woolens, castorines, moscows, kerseys, broadcloths, doeskins, elastic doeskins, elysians. F 73 and 74. 235
- 717 Broad Brook Co., Broad Brook, Conn.—Fancy cassimeres. F 75. 235
- 718 Weybosset Mills, Providence, R. I.—Fancy cassimeres. F 74. 235
- 719 Howard, R., & Son, Apponang, R. I.—Woolen stocking yarns, fancy and plain colors. B 75. 235
- 720 Wanskuck Co., Providence, R. I.—Worsted coatings, overcoatings, kerseys. B 75. 235
- 721 Rodman, Robt., La Fayette, R. I.—Doeskins. N 75. 235
- 722 Sawyer Woolen Mills, Dover, N. H.—Silk and wool cassimeres, fancy cassimeres, double and twist cassimeres. F 75. 235

Woolen Goods, Carpets.

- 723 Hinsdale Bros., Hinsdale, Mass.**
—Kerseys, beavers, worsted suitings, etc.
B 74. 235
- 724 Rockville Manufacturing Co.,**
Rockville, Conn.—Fancy cassimeres and
worsted. B 74. 235
- 725 Hockanum Co., Rockville, Conn.**
—Fancy cassimeres and worsteds. B
74. 235
- 726 Bennett & Smith, New York,**
N. Y.—Felted cloths and felt skirts printed
by patent process, fancy cassimeres, bal-
moral skirts. F 75. 235
- 727 Eddy's, Jesse, Sons, Fall River,**
Mass.—Woolens for men's wear. F
74. 235
- 728 U. S. Bunting Co., Lowell, Mass.**
—Bunting, flags, worsted damasks and
moreens, skirtings, worsted yarns. H
76. 235
- 729 Middlesex Co., Lowell, Mass.—**
Woolen goods. B 77. 235
- 730 Germania Mills, Holyoke, Mass.**
—Eskimos, doeskins, and fur beavers,
overcoatings. C 78. 235
- 731 Norway Plains Co., Rochester,**
N. H.—Blankets. B 73. 235
- 732 Norwich Woolen Co., Norwich,**
Conn.—Blankets and repellents. B 73. 235
- 733 Union Manufacturing Co., Wol-**
cottville, Conn.—Black doeskins. B 73. 235
- 734 Meriden Woolen Co., West Meri-**
den, Conn.—Fancy cotton warp cassi-
meres and coatings. B 73. 235
- 735 Niantic Woolen Mills, Norwich,**
Conn.—Suitings and repellents. B 73. 235
- 736 Mason, C. F., & Co., Providence,**
R. I.—Fancy cassimeres. B 76. 235
- 737 Wood, Morrell, & Co., Woodvale**
Woolen Mills, Johnstown, Pa.—Cassi-
meres made from half blood wool. B
77. 235
- 738 Berkshire Woolen Co., Great**
Barrington, Mass.—Cotton warp cassi-
meres. B 75. 235
- 739 Steam Woolen Co., Catskill, N. Y.**
B 73. 235
a Fancy cassimeres. 235
b Woolen shawls, long and square. 237
- 740 Peirce, C. W., & I., Bristol, Pa.**
G 78. 235
a Polishing felts and crumb cloths. 235
b Skirts. 238
- 741 Mississippi Mills, Wesson, Miss.**
—Wool fillings, jeans, cassimeres, tweeds,
linseys. F 76. 235
- 742 Bullock, Geo., & Jas. M., Consho-**
hocken Woolen Mills, Conshohocken, Pa.
—Doeskins, moscows, beavers, cloth. F
75. 235
- 743 Fox, Henry, & Co., Urbana, Ohio.**
D 78. 235
a Cassimeres, tweeds, satincts, and
yarns. 235
b Flannels. 236
- 744 Belfast Mills, Philadelphia, Pa.**
N 76. 235
a Cheviots. 235
b Dress goods. 238
- 745 Roy, Jas., & Co., West Troy,**
N. Y. F 77. 235
a Suitings and yarns. 235
b Woolen shawls. 237
- 746 Fay, C. J., Camden, N. J.**
F 74. 235
a Felt roofing and siding. 235
b Ceiling and floor carpeting. 239
- 747 McKee, Jos. D., Penn Knitting**
Mills, Philadelphia, Pa. N 74. 235
a Cloths, fancy woolen goods. 235
b Worsted shawls. 237
- 748 Bates Manufacturing Co., Lewis-**
ton, Maine. R 78. 235
a Beavers and repellents. 235
b Dress goods. 238
- 749 Lippitt Woolen Co., Providence,**
R. I. B 73. 235
a Elysian beaver overcoatings, fancy cassi-
meres, and suitings. 235
b Flannels. 236
- 750 Peace Dale Manufacturing Co.,**
Peace Dale, R. I. F 77. 235
a Cassimeres, coatings, lastings, etc. 235
b Woolen shawls. 237
- 751 Schofield, Seville, Philadelphia,**
Pa. B 74. 235
a Picce goods and coatings. 235
b Blankets. 237
- 752 Camden Woolen Mills, Philadel-**
phia, Pa. B 76. 235
a Woolen goods, cassimeres, suitings, cloak-
ings, repellents. 235
b Plaid opera flannels. 236
c Dress goods, etc. 238
- 753 Pigna Woolen Mills, Pigna, Ohio.**
B 75. 235
a Paper makers' felts and yarns. 235
b Flannels. 236
c Blankets. 237
- 754 Washington Mills, Lawrence,**
Mass. F 73 and 74. 235
a Worsted coatings, cloakings, and repel-
lents. 235
b Flannels. 236
c Worsted goods, shawls, and dress
goods. 238
- 755 Landenberger's, Martin, Sons,**
Philadelphia, Pa. F 67. 235
a Worsted coatings and yarns. 235
b Shawls. 237
c Dress goods. 238
- 756 Dobson, Jno., & Jas., Philadel-**
phia, Pa. H 77. 235
a Cloths. 235
b Blankets. 237
c Carpets. 239
- 757 Steffan, F., & Co., Philadelphia,**
Pa. B 77. 235
a Coatings. 235
b Shawls. 237
c Worsted dress goods. 238
- 758 Pontoosue Woolen Manufactur-**
ing Co., Pittsfield, Mass. F 76. 235
a All-wool cloths and repellents. 235
b Sleeping car blankets and summer
dusters. 237
c Dress goods. 238
d Carriage rugs. 239
- 759 Belvidere Woolen Manufacturing**
Co.—Flannels. F 74. 236
- 760 Damon, Smith, & Co., Westvale,**
Mass.—All-wool, Shaker, and domet flan-
nels. F 76. 236
- 761 Ballard Vale Mills, New York,**
N. Y.—Fine white flannels. B 75. 236
- 762 Waumbeek Co., New York, N.**
Y.—Plain white flannels. B 75. 236
- 763 Norway Plains Co., New York,**
N. Y.—Plain white flannels. B 75. 236

Woolen Goods, Carpets, Silks.

- 764 Lucas, B., & Co., New York, N. Y.—Plain white domets and Shakers. B 75. 236
- 765 Groveland Mills, New York, N. Y.—Scarlet, yellow, and blue plain flannels, scarlet and blue twilled flannels, scarlet Shaker opera flannels. B 75. 236
- 766 Columbia Spring Co., New York, N. Y.—Fancy flannels. B 75. 236
- 767 Stott, C. H. & F. H., New York, N. Y.—Mixed twilled flannel. B 75. 236
- 768 Titus, E., & Sons, New York, N. Y.—White and Shaker flannels. B 75. 236
- 769 Lyman Mills, Holyoke, Mass.—Flannels. C 78. 236
- 770 Gilbert, Geo. H., Manufacturing Co., Ware, Mass. F 72.
a Flannels—white, opera, silk warp, plaid, moleskin, swansdown, gauze, medicated, etc. 236
b Blankets. 237
- 771 Bachman, S., New York, N. Y.—Shawls. B 75. 237
- 772 Gibson & Tyler, New York, N. Y.—Fine white blankets. B 75. 237
- 773 Waterloo Woolen Manufacturing Co., Waterloo, N. Y.—Woolen shawls. B 77. 237
- 774 Mission Woolen Mills, San Francisco, Cal. B 75.
a Blankets. 237
b Woolen fabrics. 238
- 775 Arlington Mills, Lawrence, Mass.—Black alpacas and mohairs, roubaix poplins; materials of which they are made. F 77. 238
- 776 Peckham Manufacturing Co., Providence, R. I.—Woolen and merino knitting yarns, tweeds, doeskins. B 76. 238
- 777 Manchester Mills, Manchester, N. H.—Worsted dress goods. N 73. 238
- 778 Turner, John, Norwich, Conn.—Dyed and printed worsted, woolen, and cotton yarns for weaving, knitting, etc. B 77. 238
- 779 Tunxis Mills, Poquonnock, Conn.—White and colored worsted yarns; process of manufacture from raw wool. B 76. 238
- 780 Tarr Alpaca Co., New York, N. Y.—Alpacas, serges, cashmeres, fancy linings. B 74. 238
- 781 Hamilton Woolen Co., Southbridge, Mass.—Delaines, reps. N 74. 238
- 782 Wood, Wm., & Co., Philadelphia, Pa.—Cotton and woolen goods. B 77. 238
- 783 Walshaw, Wm., Saxonville, Mass.—Colored wool and yarns. F 69. 238
- 784 Lowell Manufacturing Co., Boston, Mass.—Serges and lastings. F 77. 238
- 785 Ramsden, David, Fulton, N. Y. B 76.
a Lastings, Italian cloths and serges, buntings. 238
b Brilliantines. 240
- 786 Wood & Haslam, Camden, N. J. B 77.
a Turkey red yarn. 238
b Quilts, table cloths. 241
- 787 Smith, Alex., & Sons Carpet Co., Yonkers, N. Y.—Power loom, axminster, tapestry brussels, and tapestry ingrain carpetings. F and H 73 to 76. 239
- 788 Wentworth, C. B., & Co., Boston, Mass.—Starquilted carpet lining. F 75. 239
- 789 Gibb & Co., Philadelphia, Pa.—Rag carpet. F 77. 239
- 790 Dornam, Bros. & Co., Philadelphia, Pa.—Ingrain carpets and damask. F 77. 239
- 791 Bromley, Jno., & Sons, Philadelphia, Pa.—Ingrain and damask Venetian carpets. H 77. 239
- 792 Leedom, Shaw, & Stewart, Philadelphia, Pa.—Carpetings. F 77. 239
- 793 Chipman, Geo. W., & Co., Boston, Mass.—Carpet lining and stair pads. F 75. 239
- 794 Taylor, Jas., & Muller, S. N., Newark, Del.—Rag and rug carpet. F 74. 239
- 795 Hartford Carpet Co., Hartford, Conn.—Brussels and three and two ply ingrain carpeting. F and H 73 to 76. 239
- 796 Wagan, R. M., Mount Lebanon, N. Y.—The Shakers' plush floor rugs. P 52. 239
- 797 Ivins, Dietz, & Magee, Philadelphia, Pa.—Three and two ply ingrain carpets. H 75. 239
- 798 Bigelow Carpet Co., Clinton, Mass.—Jacquard brussels and wilton carpets, rugs and mats. F and H 73 to 76. 239
- 799 Lowell Manufacturing Co., Boston, Mass.—Wilton and brussels, two and three ply ingrain carpeting. F and H 73 to 76. 239
- 800 Roxbury Carpet Co., Boston, Mass.—Tapestry carpeting. F and H 73 to 76. 239
- 801 Read Carpet Co., Bridgeport, Conn.—Two-ply ingrain carpets. H 77. 239
- 802 Farrington & Kinsey, Rahway, N. J.—Wool extracted from rags. B 76. 240
- 803 Pawtucket Hair Cloth Co., Pawtucket, R. I.—Automatically woven hair cloths for upholstery. B 74. 240
- Silk and Silk Fabrics, and Mixtures in which Silk is the predominating Material.**
- 804 Belding Bros. & Co., Rockville, Conn. H 76.
a Twisted silk in gum, raw silk, cocoons. 242
b Machine twists; sewings, embroidery, and saddlers' silks; buttonhole twist. 243
- 805 Aub, Hackenburg, & Co., Philadelphia, Pa. H 76.
a Raw silk and cocoons. 242
b Machine and buttonhole twist, sewing and spool silk. 243
- 806 Franke, Louis, New York, N. Y. H 74.
a Thrown silk. 242
b Silk fringes, passanterie, braids, cords, tassels. 249
- 807 Hamil & Booth, Paterson, N. J. H 76.
a Raw and thrown silks. 242
b Dress goods, tie silks. 245
c Ties. 247
d Ribbons. 248

Silk, Clothing.

- 808 Seavey, Foster, & Bowman, Boston, Mass.** H 75.
a Cocoons, raw silk. 242
b Twisted silk. 243
- 809 Werner, Itschner, & Co., Philadelphia, Pa.**—Silk ribbon fabrics. H 74. 243
- 810 Brainerd, Armstrong, & Co., New York, N. Y.**—Spool and skein silks, black and colors. H 75. 243
- 811 Hovey, F. S., Philadelphia, Pa.**—Sewing silks and machine twists. H 76. 243
- 812 Morel, Chas., & Sons, Philadelphia, Pa.**—Skein silks dyed. H 76. 243
- 813 Cheney Brothers, Hartford and South Manchester, Conn.** H 75.
a Twist. 243
b Spun silks and spun silk fabrics. 244
c Dress goods, serges, florentines, and foulards. 245
d Organzine, tram, and handkerchiefs. 247
e Ribbons. 248
- 814 Atwood & Richmond, Brooklyn, Conn.**—Ounce silk machine twist, black and colors. H 77. 243
- 815 Nonotuck Silk Co., Florence, Mass.**—Black and colored machine twist, buttonhole twist, embroidery and sewing silk. H 74. 243
- 816 Hayden, J. H., & Son, Windsor Locks, Conn.**—Black sewing silk. H 76. 243
- 817 Heminway, M., & Sons Silk Co., New York, N. Y.**—Spool, embroidery, and saddlers' silk; machine and buttonhole twist, etc. H 73. 243
- 818 Holland Manufacturing Co., Williamantic, Conn.**—Silk machine twist and sewing silk. H 74. 243
- 819 Baare, Fred., Paterson, N. J.**—Millinery, tie, and umbrella silks. H 77. 244
- 820 Strange, Wm., & Co., Paterson, N. J.** H 73
a Millinery and dress silks. 245
b Ribbons. 248
- 821 Dexter, Lambert, & Co., New York, N. Y.** H 73.
a Silk piece goods. 245
b Ribbons. 248
c Dress trimmings. 249
- 822 Soliliac, A., & Sons, Paterson, N. J.**—Dress silks. H 73. 245
- 823 Wright, Wm. P., Philadelphia, Pa.**—Oiled silks and muslins. H 76. 245
- 824 Simon, Herman, Union, N. J.**—Black and colored dress silks. H 75. 245
- 825 Weidmann, Jacob, Paterson, N. J.**—Dyed silk, blacks and colors. H 76. 246
- 826 American Silk Label Manufacturing Co., New York, N. Y.**—Names of signers of Declaration of Independence, labels and other designs, woven in silk. H 77. 246
- 827 Meyenberg, S. M., Paterson, N. J.** H 74.
a Silks, upholstery satins. 246
b Ladies' silk scarfs, sewing silk veils. 247
- 828 Stearns, Jno. N., & Co., New York, N. Y.** H 77.
a Brocade silks. 246
b Silk handkerchiefs. 247
- 829 Tilt, B. B., & Son, New York, N. Y.** H 74.
a Silk woven portraits and piece goods. 246
b Silk scarfs and handkerchiefs. 247
- 830 Soliliac, A., & Sons, Paterson, N. J.**—Ribbons. H 73. 248
- 831 Horstmann, W. H., & Sons, Philadelphia, Pa.**—Dress, carriage, and upholstery trimmings; narrow textile fabrics; passanterie. H 73. 249
- 832 Kohn, Tobias, Novelty Weaving and Braiding Works, Hartford, Conn.**—Star and embroidery braids. H 76. 249
- 833 Dale Manufacturing Co., Paterson, N. J.**—Silk, mohair, and fancy trimming braids; cords, bindings, hat bands, braided sewings, and watch guards. H 75. 249
- 834 Kemper, J., & A., Philadelphia, Pa.**—Ladies' dress trimmings. H 77. 249
- 835 Fleisher, S. B., & M., Philadelphia, Pa.**—Alpaca braids. F 71. 249
- 836 Sutro Bros., New York, N. Y.**—Embroidery braids. F 71. 249
- 837 Nottingham Lace Works, Brooklyn, N. Y.**—Guipure, thread, cashmere, and other laces and trimmings; hair nets. H 75. 249
- 838 Turner, John, Norwich, Conn.**—Picture and furniture cords. B 77. 249
- 839 Goff, D., & Son, Pawtucket, R. I.**—Alpaca skirt braid. F 71. 249
- 840 Silver Lake Co., Boston, Mass.**—Solid braided cords. F 68. 249
- 841 Kelty, G. L., & Co., New York, N. Y.**—Furniture coverings, gimps, fringes, cords, tassels, and other upholstery goods. C 78. 249
- . Clothing, Jewelry, and Ornaments, Traveling Equipments.**
- 842 Häpke, A. B., Harrisburg, Pa.**—Knit goods and embroideries. F 69. 250
- 843 Moore, Leopold, Philadelphia, Pa.**—Wrappers, shirts, silk hats. F 73. 250
- 844 Sachse, F., & Son, Philadelphia, Pa.**—Dress, cricket, fire, base ball, boating, yachting, and society shirts. F 69. 250
- 845 Butterick, E., & Co., New York, N. Y.**—Paper patterns for ladies' and children's garments. H 70. 250
- 846 Smith & Van Culin, Philadelphia, Pa.**—White and colored shirts. F 71. 250
- 847 Chapman, Mrs. Harriet M., Philadelphia, Pa.**—Skirt supporting shoulder brace and puff corset. F 69. 250
- 848 Politzer, Jacob, Philadelphia, Pa.**—Ladies' dresses and theatre costumes. F 70. 250
- 849 Schuyler, Hartley, & Graham, New York, N. Y.**—Military and naval equipments, society and theatrical goods. F 70. 250
- 850 Glazier, J. J., Bro. & Co., Philadelphia, Pa.**—Brown, bleached, and colored hose and half hose. F 72. 250
- 851 Judson Bros., New York, N. Y.**—Shirts, underwear, drawers. F 70. 250
- 852 Thalheimer & Hirsch, Philadelphia, Pa.**—Gentlemen's white and fancy shirts, underwear, collars, and cuffs. F 71. 250

Clothing.

- 853 Michaelis & Kaskel, New York, N. Y.—Shirts, underwear, and pjamas; anti-rheumatic flannels. F 67. 250
- 854 Harvey & Baird, Philadelphia, Pa.—Shirts. F 72. 250
- 855 Scott, J. W., & Co., Philadelphia, Pa.—Shirts, collars, cuffs, undershirts, drawers, and men's furnishing goods. F 70. 250
- 856 Devlin & Co., New York, N. Y.—Clothing for men and boys, uniforms of army, navy, and national guard, gentlemen's house garments. F 67. 250
- 857 Prindle, G. H., Philadelphia, Pa.—Muffs and boas, caps, cloaks, afghans, capes, hoods, designs for bed spreads. F 70. 250
- 858 Moore, George, New York, N. Y.—Bias and bias neck cutter. H 71. 250
- 859 Thomas, A. W., Philadelphia, Pa.—Bustle, skirt elevator, bosom form. F 70. 250
- 860 Rosenbach & Co., Philadelphia, Pa.—Shirts, pantaloons, overalls, drawers. F 68. 250
- 861 Conrad Bros., Philadelphia, Pa.—Shirts, collars, cuffs, etc. F 67. 250
- 862 National Suspender Co., New York, N. Y.—Shoulder braces and suspenders. F 68. 250
- 863 Cohn, M., & Co., Novelty Corset Works, New York, N. Y.—Woven corsets. F 69. 250
- 864 Piqua Woolen Mills, Piqua, Ohio.—Jackets and woolen socks. B 75. 250
- 865 Taylor, S. T., New York, N. Y.—System of dressmaking, bias cutter, fashion journals. N 65. 250
- 866 Hopkins, W. T., Philadelphia, Pa.—Ladies' and children's undergarments, infants' dresses, hoop skirts, corsets, panniers, bustles. F 69. 250
- 867 Horstmann, Wm. H., & Sons, Philadelphia, Pa.—Military and theatrical goods. H 73. 250
- 868 Demorest, Mme., New York, N. Y.—Fashion patterns and bulletin, dress-cutting system, corsets, shoulder brace, skirt and stocking suspenders. F 68. 250
- 869 Nashawannuch Manufacturing Co., Easthampton, Mass.—Elastic rubber suspenders and webs. F 67. 250
- 870 Altman, Moritz, Camden, N. J.—Cloth leather surface suspenders. F 70. 250
- 871 Thompson, E. O., Philadelphia, Pa.—Clothing. F 71. 250
- 872 Sternberger, L., & S., Philadelphia, Pa.—White shirts. F 68. 250
- 873 Norfolk and New Brunswick Hosiery Co., New Brunswick, N. J.—Ladies', gentlemen's, and children's knitted underwear. F 70. 250
- 874 Warner Bros., New York, N. Y.—Corset and skirt supporter, corset waist. F 70. 250
- 875 Bowers, Jas., & Co., Newark, J.—Sewed corsets and rivetless corset clasps. F 69. 250
- 876 Alkinson, Henry, Philadelphia, Pa.—White shirts, buckskin shirts and drawers. F 70. 250
- 877 Zäuner, Henry, Philadelphia, Pa.—Lace, silk, and meo caps, hand knit and crochet zephyr goods, for infants. F 70. 250
- 878 Sullivan, F. W., & Co., Newark, N. J.—Cork bosom pad. F 69. 250
- 879 Borm, L., Philadelphia, Pa.—Dress suit. F 69. 250
- 880 Wilson, J. H., Philadelphia, Pa.—Military goods. F 70. 250
- 881 Foy & Harmon, New Haven, Conn.—Skirt supporting corset. F 69. 250
- 882 America Hosiery Co., New Britain, Conn.—Wool, merino, and cotton underwear, hosiery. F 68. 250
- 883 Worcester Corset Co., Worcester, Mass.—Corsets, corset and skirt supporters. F 69. 250
- 884 Boston Comfort Corset Co., Boston, Mass.—Corset without bones. F 69. 250
- 885 Palmer & Williams, Boston, Mass.—Jacqueline corsets and misses' waists. F 69. 250
- 886 Denham, T. M., & Brother, New Bedford, Mass.—White laundried shirts and shirt bosoms. F 68. 250
- 887 Rockhill & Wilson, Philadelphia, Pa.—Clothing. F 69. 250
- 888 Lowell Hosiery Co., Lowell, Mass.—Women's plain cotton hose. F 69. 250
- 889 Wanamaker & Brown, Philadelphia, Pa.—Gentlemen's, youths', and children's ready-made clothing; gentlemen's furnishing goods. B 67. 250
- 890 Wanamaker, John, & Co., Philadelphia, Pa.—Ancient and modern clothing worn by American gentlemen during the past century. T 60. 250
- 891 Smith, Chester L., & Co., Philadelphia, Pa.—Gentlemen's fine dress shirts. F 68. 250
- 892 Cummings, J. S., & Co., Philadelphia, Pa.—Scarfs, cravats, stocks, bows, and neck wear. F 68. 250
- 893 Hughes, Thos., & Co., Bristol, Pa.—Cotton, merino, and wool hosiery. F 70. 250
- 894 Strahan, Hodgson, & Co., New York, N. Y.—Linen collars and cuffs. F 72. 250
- 895 American Suspender Co., Waterbury, Conn.—Webbing frills and suspenders. F 68. 250
- 896 Brewster Bros. & Co., Birmingham, Conn.—Corsets, combined corset and skirt supporters, corset clasps. F 69. 250
- 897 Gabriel, Henry, & Sons, Allentown, Pa.—Knitted woolen and cotton hosiery. F 68. 250
- 898 American Molded Collar Co., Boston, Mass.—Combined cloth and paper collars. F 70. 250
- 899 Frost, Geo., & Co., Boston, Mass.—Corsets, waists, hose supporter, emancipation suit and under-flannel. F 70. 250
- 900 Sweet, Orr, & Co., Wappinger's Falls, N. Y.—Pantaloons, overall, jackets, hunting coats. F 76. 250

Clothing.

- 901** Bickford, Dana, New York, N. Y.—Knitted articles made on Dana Bickford's knitting machines. F 68. 250
- 902** Dreifus, S., Philadelphia, Pa.—Hand-made zephyr goods, jackets, nubias, hoods, leggings, mittens, caps, sacks, etc. F 70. 250
- 903** Landenberger's, Martin, Sons, Philadelphia, Pa.—Hosiery and knit goods. F 67. 250
- 904** United States Corset Co., New York, N. Y.—Corsets. B 71. 250
- 905** Sharpless & Sons, Philadelphia, Pa.—Ladies' costumes. B 68. 250
- 906** Rothschild Bros. & Gutman, New York, N. Y.—Shirts, drawers, and undershirts. F 69. 250
- 907** Cameron, Wm., & Son, Philadelphia, Pa.—Embroidering, braiding, and stamping designs, children's clothing, indelible ink marking. F 70. 250
- 908** Dress Reform Co., Boston, Mass.—Dress reform clothing. F 71. 250
- 909** Otis Co., Palmer, Mass.—Hosiery and underwear. N 75. 250
- 910** Hayden, James, Philadelphia, Pa.—Shirts, drawers, and necktie shields. F 72. 250
- 911** Peck & Greene, Brooklyn, N. Y.—Worsted and silk goods for theatrical, boating, and general underwear. B 75. 250
- 912** Star Knitting Co., Cohoes, N. Y.—Cotton, woolen, and merino shirts, drawers, pantalets, and union suits. F 67. 250
- 913** Parsons, J. H., & Co., Cohoes, N. Y.—Cotton, woolen, and merino shirts, drawers, pantalets, and union suits. F 67. 250
- 914** Brookside Hosiery Mills, Troy, N. Y.—Cotton, woolen, and merino shirts, drawers, pantalets, and union suits. F 67. 250
- 915** McDonnell, Kline, & Co., Amsterdam, N. Y.—Cotton, woolen, and merino shirts, drawers, pantalets, and union suits. F 67. 250
- 916** Bennett, E., Brooklyn, N. Y.—Shirts. F 68. 250
- 917** Coon & Van Volkenburgh, Troy, N. Y.—Men's linen collars and cuffs. F 67. 250
- 918** Ellis Manufacturing Co., Waltham, Mass.—Stocking supporters. H 71. 250
- 919** Homer, Colladay, & Co., Philadelphia, Pa. F 71.
a Ladies' dresses, trousseaux, neckties, scarfs, and furnishing goods. 250
b Embroidery, lingerie. 252
- 920** Pettingell & Sawyer, East Cambridge, Mass. F 67.
a Waterproof oil clothes. 250
b Waterproof hats. 251
- 921** Carney, Bernard L., Philadelphia, Pa.—Silk, beaver, and felt hats. B 70. 251
- 922** Jacoby, Theo., Philadelphia, Pa.—Hats, bonnets with domestic trimmings. F 70. 251
- 923** Hegle, Fortuné, New York, N. Y.—Material for kid glove manufacturing and kid gloves. B 68. 251
- 924** Stetson, John B., & Co., Philadelphia, Pa.—Soft and stiff felt hats in various stages of manufacture. B 70. 251
- 925** Walton, Maison, New York, N. Y.—Bonnets and round hats. F 71. 251
- 926** Littleton Saranac Buck Glove Co., Boston, Mass.—Grain tanned gloves. B 69. 251
- 927** Ryan, Wm., New York, N. Y.—Hats, improved body and ventilator. B 70. 251
- 928** Brown, Emma, New York, N. Y.—Straw round hats and feathers. B 70. 251
- 929** Nonnenberger, Christian, Philadelphia, Pa.—Hatters' blocks and tools. B 69. 251
- 930** Fenton, J. H., & Bro., Philadelphia, Pa.—Gentlemen's dress, silk, soft and stiff felt, and other hats. B 70. 251
- 931** Pierson & Herman, Newark, N. J.—Hat blocks and flanges, hatters' tools. B 70. 251
- 932** Yates, Wharton, & Co., Newark, N. J.—Fur felt hats. B 70. 251
- 933** Field, J. C., & J. F., Philadelphia, Pa.—Gloves. B 69. 251
- 934** Hays, Daniel, Gloversville, N. Y.—Buckskin and peccary skin gloves, gauntlets, and mittens. B 71. 251
- 935** Miller, Knight, & Co., New York, N. Y.—Gents' dress silk and business hats. B 70. 251
- 936** Crofut & Knapp, South Norwalk, Conn.—Soft and stiff fur hats. B 70. 251
- 937** Haverhill Hat Co., Haverhill, Mass.—Wool hats. B 69. 251
- 938** Solmans, Alden, South Norwalk, Conn.—Felt hats. B 71. 251
- 939** Morris, E., & Co., Philadelphia, Pa.—Silk, soft, and stiff hats. B 71. 251
- 940** Amidon's Son, T. H., New York, N. Y.—Hats and caps. B 70. 251
- 941** Dunlap & Co., New York, N. Y.—Gents' hats, ladies' riding hats. B 70. 251
- 942** Kennedy, Thos., & Bro., Philadelphia, Pa.—Wax figure in bridal costume, trimmed bonnets and hats. F 72. 251
- 943** Schiller, Jos., & Co., St. Louis, Mo.—Hats for gentlemen's wear. B 69. 251
- 944** Clark, Samuel, New York, N. Y.—American conforming apparatus for fitting hats. B 71. 251
- 945** Hutchinson, John C., Johnstown, N. Y.—Gloves and gauntlets. B 71. 251
- 946** Northrup, W. S., & M. S., Johnstown, N. Y.—Gloves and gauntlets. B 71. 251
- 947** Colwell, F. E., & Co., Chicago, Ill.—Husking gloves. P 51. 251
- 948** Kohn, Morris, New York, N. Y.—Gloves, gauntlets, and mittens. B 72. 251
- 949** Bancroft, J. S., & Co., New York, N. Y.—Hats and caps, boys' and children's hats. B 72. 251
- 950** Kursheedt & Co., New York, N. Y.—Rufflings, flutings, etc., collarettes, embroideries, ties, ladies' collars and cuffs. F 69. 252
- 951** Bentley, Jeff. O., Philadelphia, Pa.—Embroidered, braided, and stamped goods, indelible marking, designs, stamps. F 72. 252

Clothing, Jewelry, Ornaments, Fancy Articles.

- 952 Barrett, Jos. W., Philadelphia, Pa.—Embroidery and braiding designs, hand worked and printed. F 72. 252
- 953 Thomas, Joel, Philadelphia, Pa.—Ruchcs, ladies' and infants' caps, ruffings, and collarettes. F 71. 252
- 954 Clickerman, L. M., Philadelphia, Pa.—Embroidery on linen cambric. F 68. 252
- 955 Palmer & Kendall, Middletown, Conn.—Mosquito net canopies with attachments, machine tented wide fabrics, mosquito nettings, cords and window lines. F 77. 252
- 956 Bedichimer, Isaac, Philadelphia, Pa.—Masonic marks, society jewels, pins, and emblems in gold and silver. N 43. 253
- 957 Muhr's, H., Sons, Philadelphia, Pa.—Finger rings and jewelry. P 43. 253
- 958 Bailey & Co., Philadelphia, Pa.—Jewelry. N 43. 253
- 959 Simons, Opdyke, & Co., Philadelphia, Pa.—Gold chains, gold head cancs, thimbles, gold and pearl jewelry. P 43. 253
- 960 Caldwell, J. E., & Co., Philadelphia, Pa.—Jewelry and artistic manufactures in the precious metals, for use and decoration. N 41. 253
- 961 Vulcanite Jewelry Co., New York, N. Y.—Vulcanite and jet and combination vulcanite and jet jewelry. P 43. 253
- 962 Goggin, Jas., New York, N. Y.—Suites of jewelry, and jewel cases of shell, jet, and bog oak. P 50. 253
- 963 Neher, Chas., Philadelphia, Pa.—Hair jewelry. P 43. 253
- 964 Starr & Marcus, New York, N. Y.—Diamonds, pearls, precious stones, rich jewels, and stone cameos. N 41½. 253
- 965 Morgan & Headly, Philadelphia, Pa.—Gold spectacles and chains, fine jewelry. N 42. 253
- 966 Cottier, C., & Son, N. Y.—Imitation of precious stones and fancy cut stones. P 44. 253
- 967 Wilson, Alex. D., New York, N. Y.—Jewelry of Scottish designs, and ornaments for the Scottish costume. P 43. 253
- 968 Richards, J. J., & J. M., New York, N. Y.—Slccve and collar buttons, studs, crosses, pins, and eardrops. P 43. 253
- 969 Haas, Jas. A., & Co., Philadelphia, Pa.—Jewelry; masonic and other emblems. N 43. 253
- 970 Hamilton & Hunt, Providence, R. I.—Plated chains and buckle bracelets. P 43. 253
- 971 Kipling's, R., Sons, New York, N. Y.—Precious and imitation stones for jewelry. N 43. 253
- 972 Tiffany & Co., New York, N. Y. N 41. 253
a Jewelry, precious stones. 253
b Gilt goods. 254
- 973 Robbins, Clark, & Biddle, Philadelphia, Pa. N 43. 253
a Jewelry, diamonds. 253
b Bronzes, fancy goods. 254
- 974 Miller, Thos., New York, N. Y.—Silk umbrellas. B 70. 254
- 975 Pope Manufacturing Co., Boston, Mass.—Rifle air pistols. H 71. 254
- 976 Wallace & Keller, Philadelphia, Pa.—Walking cancs, bell earrings, and fancy articles. B 72. 254
- 977 Birgé & Berg, Philadelphia, Pa.—Artificial flowers, picture of lion, made of flowers. F 72. 254
- 978 Glendenning & Truitt, Philadelphia, Pa.—Whips. B 71. 254
- 979 Lacmarr, J., & Sons, Philadelphia, Pa.—Doll bodies. F 72. 254
- 980 Pilling, George P., Philadelphia, Pa.—Society jewels and small wares. N 52. 254
- 981 Beader, Adamson, & Co., Philadelphia, Pa.—Cowhide whips. N 68. 254
- 982 Wilson, John, Philadelphia, Pa.—Carved walking cancs. B 69. 254
- 983 Hirsh & Brother, Philadelphia, Pa.—Umbrellas, parasols, and materials. B 72. 254
- 984 Galbraith, Alex., Philadelphia, Pa.—Wax flowers and materials. F 71. 254
- 985 Richardson, C. D., & Co., Philadelphia, Pa.—Umbrellas, parasols, and cancs. B 71. 254
- 986 Potter, W. K., Providence, R. I.—Tortoise shell goods, combs, jewelry, etc. P 43. 254
- 987 Nickle, Robt., Rochester, N. Y.—Magical apparatus and toys. J 78. 254
- 988 Bloodgood, Miss A. De Etta, New York, N. Y.—Sheet wax, wax flowers, leaves, shells, fruit, etc.; illuminated and rustic crosses. P 42. 254
- 989 Chambers & Co., Philadelphia, Pa.—Umbrellas, parasols, and sun umbrellas. B 72. 254
- 990 Johnson, E. S., New York, N. Y.—Tooth picks and ear spoons. N 43. 254
- 991 Palm, Chas., & Co., New York, N. Y.—Transfer ornaments for decorating. B 78. 254
- 992 Wahl, Emil, Philadelphia, Pa.—Fancy bone work, dominoes, chessmen, crochet needles, buttons, jewelry, etc. N 43. 254
- 993 India Rubber Comb Co., New York, N. Y.—Hard rubber combs, syringes, drinking flasks; surgical, telegraphic, and photographic goods, etc. B 67. 254
- 994 Leiner, Moritz, New York, N. Y.—Ear cleaners, filtering racks, sponge baskets. T 46. 254
- 995 Aiken, Lambert, & Co., New York, N. Y.—Tooth picks. N 43. 254
- 996 Koch, Sons, & Co., New York, N. Y.—Albums and backgammon boards. P 76. 254
- 997 Giraudat, Ambrose, New York, N. Y.—Artificial flower materials. F 70. 254
- 998 Ellis, Knapp, & Co., New York, N. Y.—Umbrellas and parasols. B 70. 254
- 999 Drown, W. A., & Co., Philadelphia, Pa.—Umbrellas and parasols. B 69. 254
- 1000 Hopkins & Robinson Manufacturing Co., Akron, Ohio—Smoking pipes and animal pokes. B 75. 254

Jewelry, Ornaments, Toys, Fancy Articles.

- 1001 Orange Judd Co., New York, N. Y.—Crandall's building blocks. 254
- 1002 Henly, David, Philadelphia, Pa.—Artificial flowers. F 72. 254
- 1003 Dickinson, Mrs. C. J., Chicago, Ill.—Wax flowers, leaves, fruit, ferns, etc. P 42. 254
- 1004 Tobin, Joseph F., New York, N. Y.—Whalebone goods. F 72. 254
- 1005 Mabie, Todd, & Baird, New York, N. Y.—Tooth picks. N 43. 254
- 1006 Saml. Wilkins & Orcutt Manufacturing Co., New York, N. Y.—Metallic shawl carriers. P 68. 254
- 1007 Riley & Lynch, Newark, N. J.—Bag and umbrella trimmings, military metal goods, masonic ornaments, etc. H 67. 254
- 1008 Celluloid Manufacturing Co., Newark, N. J.—Toilet brushes, etc., made from celluloid. N 43. 254
- 1009 Braeunlich, Wm., & Co., New York, N. Y.—Tooth picks. N 43. 254
- 1010 Leonhard, Theo., Paterson, N. J.—Bleached beeswax, metallic moulds for flowers, tapers. N 56. 254
- 1011 Bradley & Hubbard Manufacturing Co., West Meriden, Conn.—Bronzes, call bells. N 47. 254
- 1012 Oelkers, John B., Newark, N. J.—Ivory, bone, horn, and rubber goods. B 76. 254
- 1013 Carlisle, Henry, & Son, Philadelphia, Pa.—Tortoise shell and horn combs, jewelry sets, and fancy articles. N 52. 254
- 1014 Althof, Bergmann, & Co., New York, N. Y.—Tin and mechanical toys. C 78. 254
- 1015 Reynolds & Shaw, Jersey City, N. J.—Rubber, shell, and jet jewelry, combs, etc. P 43. 254
- 1016 Bickel, August, & Son, Philadelphia, Pa.—Crutches and canes. B 71. 254
- 1017 Heister & Gans, New York, N. Y.—Automatic umbrellas and parasols. B 69. 254
- 1018 Kaldenberg, Fred. Julius, New York, N. Y.—Genuine meerschaum pipes and cigar holders, amber goods. P 66. 254
- 1019 Holland, John, Cincinnati, Ohio.—Tooth picks. N 43. 254
- 1020 Adams, J. H., & Co., Providence, R. I.—Tortoise shell jewelry and combs. N 42. 254
- 1021 American & Howe Pin Co., New York, N. Y.—Brass and iron pins. F 71. 254
- 1022 Wagan, R. M., Mount Lebanon, N. Y.—Fancy articles made by the Shakers. P 52. 254
- 1023 Stehr, Carl, New York, N. Y.—Meerschaum and amber goods. B 75. 254
- 1024 Harvey & Ford, Philadelphia, Pa.—Canes, umbrella and whip handles, pipes, billiard balls; pearl, horn, and ivory work. B 70. 254
- 1025 Waterbury Button Co., Waterbury, Conn.—Army, navy, railroad, police, state, livery, and cloth buttons; ladies' belt buckles, medals, and badges. B 76. 254
- 1026 Novelty Manufacturing Co., Waterbury, Conn.—Umbrella, parasol, and pipe trimmings; belt clasps, chains, and small brass and plated goods. F 71. 254
- 1027 Armstrong, F., Bridgeport, Conn.—Duplex ventilated garters and armlets. F 72. 254
- 1028 Field, A., & Sons, Taunton, Mass.—Buttons and eyelets. P 68. 254
- 1029 Cook, Norman, New York, N. Y.—Satina umbrellas. B 71. 254
- 1030 Cross, Richard, & Son, Providence, R. I.—Tooth picks. N 43. 254
- 1031 Mitchell, Vance, & Co., New York, N. Y.—Bronzes. N 49. 254
- 1032 Independent Comb Co., Wappinger's Falls, N. Y.—Ladies' horn and rubber combs, dressing combs, pipe stems, and bits. B 73. 254
- 1033 Barnhurst & Robinson, Philadelphia, Pa.—Umbrella and parasol stretchers. B 70. 254
- 1034 Grottenthaler, V., Philadelphia, Pa.—Block for wood engravers, wooden smoking pipes. B. 74. 254
- 1035 Ives, Blakeslee, & Co., Bridgeport, Conn.—Mechanical toys and novelties. F 72. 254
- 1036 The Mains Manufacturing Co., New York, N. Y.—Dice box. N 65. 254
- 1037 Nax, Kuhn, & Silberman, Philadelphia, Pa.—Tobacco pipes, umbrella and parasol handles, cigar tubes, etc. B 75. 254
- 1038 National Button Co., Easthampton, Mass.—Cloth-covered, vegetable, and ivory buttons. B 76. 254
- 1039 Spaulding, D. S., Mansfield, Mass.—Tortoise shell jewelry, back combs, and fancy goods. N 43. 254
- 1040 Sevey, J. A., Boston, Mass.—Articles of whalebone, for whips, canes, corsets, dresses, etc. B 70. 254
- 1041 Eureka Manufacturing Co., Boston, Mass.—Air pistols. H 71. 254
- 1042 Joslin, Palmer, & William, New York, N. Y.—Horn and rubber goods, fancy back combs, and jewelry. N 43. 254
- 1043 Hildreth, Milo, & Co., Northboro, Mass.—Horn and tortoise shell combs and jewelry. N 43. 254
- 1044 Quackenbush, H. W., Herkimer, N. Y.—Air gun and pistol darts. N 58. 254
- 1045 Fiske Bros. & Co., New York, N. Y.—Parasols and umbrellas. F 67. 254
- 1046 Todd, Edward, & Co., New York, N. Y.—Tooth picks. N 43. 254
- 1047 Lane Manufacturing Co., Waterbury, Conn.—Belt buckles, buttons, curtain racks; metal goods. F 70. 254
- 1048 Harris, S., & Sons Manufacturing Co., Clinton, Mass.—Dressing and fancy combs, imitation jet and shell chains. H 71. 254
- 1049 Wild, G. L., & Brother, Washington, D. C.—Musical dancing toy attachment for pianos. N 64. 254
- 1050 Moutoux, Emil W., New York, N. Y.—Hair pictures and devices for breastpins. P 52. 254

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- 1051 Grote, F., & Co., New York, N. Y.—Carved and turned ivory; pearl and shell goods. B 71. 254
- 1052 Ansley, Fred. W., St. Augustine, Fla.—Jewelry made from native Florida material. H 68. 254
- 1053 Lambeth, Samuel W., Philadelphia, Pa.—Fly fan moved by clockwork. H 71. 254
- 1054 The Platt Bros. & Co., Waterbury, Conn.—Buttons. H 71. 254
- 1055 Cheshire Manufacturing Co., West Cheshire, Conn.—Buttons. H 71. 254
- 1056 Godfrey, C. J., & Son, Naugatuck, Conn.—Thimbles. H 71. 254
- 1057 Comstock Dickinson Ivory Co., Center Brook, Conn.—Ivory fine combs. H 71. 254
- 1058 Blake and Johnson, Waterbury, Conn.—Satin finish hair pins. H 71. 254
- 1059 Ives, Blakeslee, & Co., Bridgeport, Conn.—Silk covered ventilated metallic garters. H 71. 254
- 1060 Peacock, H. H., Philadelphia, Pa.—Fancy cases in morocco, velvet, and marqueterie, for jewelry, etc.; physicians' cases. P 63. 253
- 1061 Rumpp, Chas., Philadelphia, Pa.—Fancy leather goods, dressing case, work boxes, pocketbooks, satchels, etc. N 69. 253
- 1062 Kolb, G. F., & Son, Philadelphia, Pa.—Cases for jewelry and silverware. B 74. 255
- 1063 Rumpp, C. F., Philadelphia, Pa.—Fancy leather goods, pocketbooks, cigar cases, satchels, and traveling bags. B 68. 253
- 1064 Parkhurst & Gridley, Newark, N. J.—Shawl and book strap. P 68. 253
- 1065 Likly, McDonald, & Rockett, Cleveland, Ohio.—Fancy leather work, gun case, etc. B 70. 255
- 1066 Stambach, John A., & Co., Philadelphia, Pa.—Ladies' and gentlemen's furs and robes. B 68. 256
- 1067 Mawson, Ed. S., & Sons, Philadelphia, Pa.—Seal sacques, muffs, caps, gloves; seal, sable, and mink skins, etc. B 68. 256
- 1068 Fishblatt, Lewis, Philadelphia, Pa.—Ladies' furs and carriage robes. B 70. 256
- 1069 Mahler, M., New York, N. Y.—Furs. B 67. 256
- 1070 Reisky, N. C., Philadelphia, Pa.—Ladies' furs, gentlemen's driving goods, sleigh robes, Indian painted buffalo robes. B 69. 256
- 1071 Booss, F., & Bro., New York, N. Y.—Fur sacques, coats, muffs, boas, caps, hats, gloves, etc. B 69. 256
- 1072 Isaacs, Judah, Philadelphia, Pa.—Ladies', children's, and gentlemen's manufactured furs. B 67. 256
- 1073 Blaylock & Co., Philadelphia, Pa.—Hats and furs, robes, fur caps, turbans, gloves, etc.; straw hats. B 71. 256
- 1074 Barciss, Fredk., Philadelphia, Pa.—Fur sets, and robes of mink, sable, beaver, ermine, and seal. B 71. 256
- 1075 Kaehler, Otto, Philadelphia, Pa.—Stuffed animals, raw and dressed skins, fur robes, fancy furs, etc. B 68. 256
- 1076 Duryee & Hallett, Rahway, N. J.—Dressed and dyed furs. H 68. 256
- 1077 Burnett, W. H., & R., Newark, N. J.—Furs, fur cloaks, and fur-lined mantles. B 68. 256
- Paper, Blank Books, and Stationery.**
- 1078 Dixon Crucible Co., Jersey City, N. J.—Pencils of graphite. P 72. 258
- 1079 McGill, Geo. W., New York, N. Y.—Fasteners for binding papers, suspending rings, erasive tips, press bowls. P 73. 258
- 1080 Hoskins, W. H., Philadelphia, Pa.—Paper, envelopes, designing, engraving, printing, and lithographing. P 76. 258
- 1081 Woodruff, E. W., Washington, D. C.—File holders. P 49. 258
- 1082 Tiffany & Co., New York, N. Y.—Stationery. N 41. 258
- 1083 Goldsborough, John, Philadelphia, Pa.—Ribbon machine and hand stamps, perforating and cancelling stamps. P 73. 258
- 1084 American Lead Pencil Co., New York, N. Y.—Lead pencils, materials, and process of manufacture. P 74. 258
- 1085 Fairchild, Leroy W., & Co., New York, N. Y.—Gold pens and holders, pen and pencil cases, etc. N 43. 258
- 1086 Faber, Eberhard, New York, N. Y.—Lead pencils, penholders, rubber goods, and stationers' articles. P 73. 258
- 1087 Cooke, G. K., & Co., New York, N. Y.—Revolving hand stamps, seal presses, rubber stereotypes, check protectors, combined pad and rack. P 77. 258
- 1088 Johnson, E. S., New York, N. Y.—Gold pens, pencils, and cases. N 43. 258
- 1089 Muller's Sons, Nicholas, New York, N. Y.—Bronze stationery ware. inkstands. P 76. 258
- 1090 Janentzky & Co., Philadelphia, Pa.—Artists' materials. P 77. 258
- 1091 Bergner, Theo., Philadelphia, Pa.—Drawing boards, parallel rulers, and section liners for draughtsmen's use. P 76. 258
- 1092 Hawkes, Geo. F., New York, N. Y.—Gold pens, gold, silver, pearl, and rubber pencils; fountain pen. N 43. 258
- 1093 Lipman, Hymen L., Philadelphia, Pa.—Eyelet machines, combining punch and riveter. P 74. 258
- 1094 Brower Bros., New York, N. Y.—Inkstands, paper weights, sponge cups, letter files, etc. P 74. 258
- 1095 Aiken, Lambert, & Co., New York, N. Y.—Gold pens, cases, pencils, etc. N 43. 258
- 1096 Buck, T. S., & Co., Davenport, Iowa.—Rubber type forms, rubber dating stamp. P 73. 258
- 1097 Stiles, Mrs. E. W., Philadelphia, Pa.—Book paper-file, revolving inkstand. P 30. 258
- 1098 Woolley, G. W., Philadelphia, Pa.—Reservoir pen. N 53. 258
- 1099 Stoddard, Richd. T., Boston, Mass.—Book supporter. P 74. 258
- 1100 Plummer, Geo. W., & Co., Newark, N. J.—Inkstands, desk furniture, school stationery, etc. P 74. 258

Stationery, Books.

- 1101 Bender & Phillips, Hohokus, N. J.**—Sheet wax. P 73. 258
- 1102 Mabie, Todd, & Baird, New York, N. Y.**—Gold pens, cases, pencils, holders. N 43. 258
- 1103 Newark Crayon Co., Newark, N. J.**—White and colored school crayons. P 77. 258
- 1104 Braeunlich, Wm., & Co., New York, N. Y.**—Gold pens, pen and pencil cases. N 43. 258
- 1105 Parkhurst & Gridley, Newark, N. J.**—Stationers' goods. P 68. 258
- 1106 Foley, John, New York, N. Y.**—Gold pens, pencils, and penholders. N 43. 258
- 1107 Chase, John S., New York, N. Y.**—Flour paste. P 77. 258
- 1108 Mason & Co., Philadelphia, Pa.**—Engraving, fine stationery, illuminating, stamping, and copper-plate printing. P 73. 258
- 1109 Foye, W. H., Portland, Maine.**—Folios and clips, combined folio, clip, and index. P 73. 258
- 1110 Holland, John, Cincinnati, Ohio.**—Gold pens, pencil cases, penholders. N 43. 258
- 1111 United States Soapstone Manufacturing Co., Cincinnati, Ohio.**—Soapstone slate pencils, blackboard crayons, tailors' markers. P 77. 258
- 1112 Hart, Bliven, & Mead Manufacturing Co., New York, N. Y.**—Stationery for the desk, gong bells. P 70. 258
- 1113 Atwater, J. H., Providence, R. I.**—Newspaper files, letter copiers, blackboard erasers, articles for school gymnasiums, etc. P 77. 258
- 1114 Lockhart, A. M., & Co., Pittsburgh, Pa.**—Patent billholder and separator, clips, arm rests, etc. P 76. 258
- 1115 Croft, Wm., & Co., New York, N. Y.**—Rubber stamps and stencils. P 74. 258
- 1116 Cross, Richard, & Son, Providence, R. I.**—Gold plated pen and pencil cases. N 43. 258
- 1117 Walker, Tucker, & Co., Philadelphia, Pa.**—Rubber hand stamps. P 74. 258
- 1118 Esterbrook Steel Pen Co., Camden, N. J.**—Pens and penholders. P 72. 258
- 1119 Eagle Pencil Co., New York, N. Y.**—Lead and mechanical pencils, copying crayons, penholders, stationery, wood and brass articles. P 76. 258
- 1120 Todd, Edward, & Co., New York, N. Y.**—Gold pens and holders, pen and pencil cases, pens, etc. N 43. 258
- 1121 Rowland, Joseph S. C., Philadelphia, Pa.**—Canceling ink pad. T 47. 258
- 1122 Edsall, D. A., New York, N. Y.**—Rubber hand stamps, stereotypes, folding rack pads. P 73. 258
- 1123 Morton, James, New York, N. Y.**—Gold pens, gold, celluloid, and pearl pencils and penholders. N 43. 258
- 1124 Donovan, J. W., Detroit, Mich.**—Record file covers, classified directory. P 58. 258
- 1125 Koch, Sons, & Co., New York, N. Y.** P 76.
- a* Bankers' cases, portfolios, patent binders, etc. 258
- b* Blank books. 261
- 1126 Moss & Co., Philadelphia, Pa.** P 77.
- a* Stationery. 258
- b* Blank books and printed books. 261
- 1127 Root, R. C., Anthony, & Co., New York, N. Y.** P 74.
- a* Office stationery. 258
- b* Account books, lithographic work. 261
- 1128 Cohen, Chas. J., Philadelphia, Pa.** P 74.
- a* Everpoint leads for pencil cases. 258
- b* Satinette copying book. 261
- c* Paper boxes. 262
- 1129 Weston, Byron, Dalton, Mass.**—Ledger and record paper. P 75. 259
- 1130 Owen Paper Co., Housatonic, Mass.**—Ledger, bond, and thin linen paper, tinted wedding royals, staple writing papers. P 73. 259
- 1131 Southworth Co., Mittineaque, Mass.**—Writing papers. P 75. 259
- 1132 Mount Holly Paper Co., Mount Holly Springs, Pa.**—Writing papers. P 73. 259
- 1133 Whiting Paper Co., Holyoke, Mass.**—Fine papers. P 77. 259
- 1134 Crescent Mills, Springfield, Mass.**—Writing papers. P 74. 259
- 1135 Holyoke Paper Co., Holyoke, Mass.**—Writing papers. P 74. 259
- 1136 Carson & Brown Co., Dalton, Mass.**—Writing paper. P 74. 259
- 1137 Parsons Paper Co., Holyoke, Mass.**—Writing paper. P 74. 259
- 1138 Crane & Co., Dalton, Mass.**—Bond, bank-note, parchment, letter, and note paper. P 74. 259
- 1139 Parker, Joseph, Son, & Co., New Haven, Conn.**—Treasury and commercial blotting paper. P 74. 259
- 1140 Jessup & Laffin, Westfield, Mass.**—Ledger papers. P 73. 259
- 1141 Plimpton Manufacturing Co., Hartford, Conn.**—Envelopes, papeteries, writing paper. P 75. 259
- 1142 Tileston & Hollingsworth, Boston, Mass.**—Steelplate, chromo, and woodcut paper. P 77. 259
- 1143 Glessner & Gilbert, Lanesville, Ohio.**—Telegraph papers. P 77. 259
- 1144 Hurlbut Paper Co., South Lee, Mass.**—Writing and blank book papers. P 73. 259
- 1145 Case, Lockwood, & Brainard Co., Hartford, Conn.** P 74.
- a* Paper. 259
- b* Printing, bookbinding, blank books, specimens of job work. 261
- 1146 Megargee Bros., Philadelphia, Pa.** P 74.
- a* Book, plate, envelope, and writing papers. 259
- b* Colored papers. 264
- 1147 Francis & Loutrel, New York, N. Y.** P 74.
- a* Manifold writers. 259
- b* Bank ledgers, diaries, safety checks. 261

Paper, Felt, Books, Cardboard.

- 1148 Oglesby, Moore, & Co., Middletown, Ohio. P 47.
a Plate, map, and super-calendered papers. 259
b Book, news print, blotting, and wrapping papers. 263
c Roofing felt. 263
- 1149 Jessup & Moore, Philadelphia, Pa.—Copperplate, lithograph, and book papers, news paper. P 74. 260
- 1150 Ivanhoe Manufacturing Co., Paterson, N. J.—Book papers, etc. P 74. 260
- 1151 Dexter, C. H., & Sons, Windsor Locks, Conn.—Manilla paper, medicated paper. P 73. 260
- 1152 Tangeman, J. H., & Co., Lockland, Ohio.—Wrapping papers. P 77. 260
- 1153 Tytus Paper Co., Middletown, Ohio.—Manilla paper. P 77. 260
- 1154 Hill, A., & Sons, Middletown, Ohio.—Paper. P 77. 260
- 1155 Tangeman, Geo. P., Hamilton, Ohio. P 77.
a Carpet paper. 260
b Roofing felt. 263
- 1156 McNeil, Irving, & Rich, Elwood, N. J. P 74.
a Carpet, manilla, flour sack, and wrapping paper. 260
b Waterproof building paper. 263
c Colored papers. 264
- 1157 Mann, Wm., Philadelphia, Pa.—Blank books for banks, parchment copying books. P 75. 261
- 1158 Altemus & Co., Philadelphia, Pa.—Photograph albums, scrap books, etc. T 73 to 78. 261
- 1159 Murphy's, W. F., Sons, Philadelphia, Pa.—Blank books, made to order for actual use. P 77. 261
- 1160 Thomas, Chas. F., Wilmington, Del.—Index for public records, etc. P 76. 261
- 1161 Kohler, Ignatius, Philadelphia, Pa.—Samples of bookbinding. T 73 to 78. 261
- 1162 Burlock, Saml. D., & Co., Philadelphia, Pa.—Bookbindings. T 73 to 78. 261
- 1163 Walker, Evans, & Cogswell, Charleston, S. C.—Blank books, law blank case. P 74. 261
- 1164 Appleton, D., & Co., Philadelphia, Pa.—Bookbinding. T 73 to 78. 261
- 1165 Sandford & Co., Cleveland, Ohio.—Full Russia bank books. P 77. 261
- 1166 Siddall Bros., Philadelphia, Pa.—Vellum printing, conveyancers' envelopes, and job and book printing. P 74. 261
- 1167 Lange, Little, & Co., New York, N. Y.—Wood cut, railroad, and job printing. T 73 to 78. 261
- 1168 Christy's, Wm. M., Sons, Philadelphia, Pa.—Blank books. P 76. 261
- 1169 Oldach & Mergenthaler, Philadelphia, Pa.—Bookbinders' work. T 73 to 78. 261
- 1170 Houghton, H. O., & Co., Riverside Press, Cambridge, Mass.—Bookbinding. T 73 to 78. 261
- 1171 Reed, A., & Co., Philadelphia, Pa.—Ornamental bookbinding. T 73 to 78. 261
- 1172 Lindsay & Blakiston, Philadelphia, Pa.—Specimens of binding. T 73 to 78. 261
- 1173 Boorum & Pease, New York, N. Y.—Blank books. P 75. 261
- 1174 Bradley & Gilbert, Louisville, Ky. P 75.
a Blank books, specimens of printing. 261
b Bonnet boards, file paper boxes. 262
- 1175 Kerr, N. M., & Co., Philadelphia, Pa.—Paper boxes, jewelers' findings. P 75. 262
- 1176 Dixon, Charles A., & Co., Philadelphia, Pa.—Engraved wedding and visiting cards, invitations, heraldic designs, and illuminations in monograms. P 75. 262
- 1177 American Paper Box Co., Philadelphia, Pa.—Fancy paper boxes. P 74. 262
- 1178 Porter & Bainbridge, New York, N. Y.—Cardboard, stationery, papeteries, etc. N 72. 262
- 1179 Dennison & Co., Boston, Mass.—Jewelers' paper boxes, cards, tags, labels, seals, tissue papers, sealing wax, jewelers' and surgical cotton. P 75. 262
- 1180 Osborn, Bennet, Newark, N. J.—Paper boxes. P 74. 262
- 1181 Dennison & Brown, Portland, Maine.—Wood pulp and products, paper boxes, etc. P 77. 262
- 1182 Cornell & Shelton, Birmingham, Conn.—Folding paper boxes. P 74. 262
- 1183 Crompton, John, & Co., Philadelphia, Pa.—Jewelers', druggists', and perfumers' boxes. P 74. 262
- 1184 Rhode Island Cardboard Co., Pawtucket, R. I.—Cardboard, cards for printers and photographers, manilla tag stock. P 74. 262
- 1185 McClement Brothers, Philadelphia, Pa.—Embossed business cards, embossed labels, cut and gummed, and impressions from notarial and society seals. P 74. 262
- 1186 Nashua Card and Glazed Paper Co., Nashua, N. H.—Fancy paper boxes, colored paper and cardboard. P 74. 262
- 1187 Dougherty, A., New York, N. Y.—Playing cards. P 77. 262
- 1188 Beck, Charles, Philadelphia, Pa. P 76.
a Cards, cardboard. 262
b Fancy, colored, glazed, enameled, and embossed papers. 264
- 1189 Davey, W. O., & Sons, Jersey City, N. J. P 77.
a Binders' trunk and box boards. 262
b Oakum. 666
- 1190 Stelwagon, Jos., & Sons, Philadelphia, Pa.—Raw and prepared roofing paper, carpet and weather boarding paper. P 76. 263
- 1191 Adams, E. A., & Son, Newark, N. J.—Trunk covers, pockets, etc. P 74. 263
- 1192 Churchill, E., Cleveland, Ohio.—Roofing felt. P 75. 263
- 1193 Ingersoll & Hobart, Beloit, Wis.—Paper, lap, and checker boards, table mats, shelves, brackets, signs, plates, etc. P 76. 263
- 1194 Gordon, A. Dunlop, Philadelphia, Pa.—Building and manilla concrete felts. P 74. 263

Paper, Ammunition, Firearms.

- 1195 Case Brothers, South Manchester, Conn.—Paper boards. P 74. 263
- 1196 Barrett, Arnold, & Kimball, Chicago, Ill. P 76.
 α Aluminous and ornamental building paper. 263
 β Paper oil cloth. 264
- 1197 Van Skelline, Theo., Brooklyn, N. Y.—Motto papers and motto flowers. P 74. 264
- 1198 Dejonge, Louis, & Co., New York, N. Y.—Fancy colored, glazed, plated, enameled, varnished, embossed, and printed papers. P 74. 264
- 1199 Beck, Fred., & Co., New York, N. Y.—Wall papers. P 76. 264
- 1200 Howell & Brothers, Philadelphia, Pa.—Paper hangings, borders, fireboard prints, and window papers. P 76. 264
- 1201 Howell & Bourke, Philadelphia, Pa.—Paper hangings and fresco decorations. P 75. 264
- 1202 Westerberg, Jefferson, & Co., New York, N. Y.—Decorations and embossed gold papers. P 76. 264
- 1203 Nagle, Cook, & Ewing, Philadelphia, Pa.—Decorative paper hanging. P 55. 264
- Military and Naval Armaments, Ordnance, Firearms, and Hunting Apparatus.**
- 1204 Union Metallic Cartridge Co., Bridgeport, Conn.—Metallic shells, bullets, wads, and percussion caps; cartridge machinery. H 70. 265
- 1205 Sparks, Thos. W., Philadelphia, Pa.—Drop shot, mould, and conical balls. H 71. 265
- 1206 Billings & Spencer Co., Hartford, Conn.—Breechloading firearms. H 72. 265
- 1207 Remington, E., & Sons, Ilion, N. Y.—Firearms and ammunition. H 67. 265
- 1208 Smith & Wesson, Springfield, Mass.—Revolving firearms. H 69. 265
- 1209 Colt's Patent Firearms Manufacturing Co., Hartford, Conn.—Breechloading military and sporting small-arms, and military and pocket revolvers for metallic ammunition. H 72. 265
- 1210 Gardner, Wm., Hartford, Conn.—Breechloading cannon, machine guns, magazine shoulder arms. H 69. 265
- 1211 Forehand & Wadsworth, Worcester, Mass.—Revolving military and sporting firearm. H 71. 265
- 1212 Rawbone, Thos., Newark, N. J.—Cartridge creaser. H 72. 265
- 1213 Whitney Arms Co., Whitneyville, Conn.—Breechloading military and sporting rifles, carbines, shotguns, revolvers, etc., with ammunition. H 72. 265
- 1214 Sharps Rifle Co., Bridgeport, Conn.—Rifles. H 72. 265
- 1215 Merchants' Shot Tower Co., Baltimore, Md.—Drop and mould shot, soft bar lead. H 71. 265
- 1216 Burgess, Andrew, Owego, N. Y.—Magazine rifles for military and sporting purposes. H 68. 265
- 1217 Goldmark, Joseph, New York, N. Y.—Percussion caps, primers, burglar alarm exploders, blasting detonators, metallic and paper cartridges, metal and paper boxes. H 71. 265
- 1218 Lovell, John P., & Sons, Boston, Mass.—Revolvers. H 72. 265
- 1219 Dana, Edw. A., Boston, Mass.—Expanding projectiles for rifled cannon. H 72. 265
- 1220 Schoverling & Daly, New York, N. Y.—Hunting and target rifles, revolvers, breechloading implements. H 70. 265
- 1221 Winchester Repeating Arms Co., New Haven, Conn.—Magazine or repeating military and sporting firearms, metallic cartridges for small arms. H 72. 265
- 1222 Wesson, Frank, Worcester, Mass.—Breechloading sporting and pocket target rifles. H 70. 265
- 1223 Rupertus, Jacob, Philadelphia, Pa.—Revolvers and repeating pistols. H 70. 265
- 1224 United States Cartridge Co., Lowell, Mass.—Metallic cartridges. H 72. 265
- 1225 American Arms Co., Boston, Mass.—Double-barreled, breechloading shotguns, and locks. H 72. 265
- 1226 Merwin, Hulbert, & Co., New York, N. Y.—Revolving firearms and magazine gun, military and sporting metallic cartridges. H 70. 265
- 1227 Evans Rifle Manufacturing Co., Mechanic Falls, Me.—Magazine rifle, carbine, and musket. H 70. 265
- 1228 Willis, Aug. L., Philadelphia, Pa.—Time and percussion shell fuse. H 71. 265
- 1229 Miller, Wm. Deeds, New York, N. Y.—Firearms. H 70. 265
- 1230 Snider, Frank H., Philadelphia, Pa.—Breechloader and needle-gun.—H 68. 265
- 1231 Stevens, J., & Co., Chicopee Falls, Mass.—Breechloading shotguns, rifles, and pistols. H 71. 265
- 1232 Taylor, Jas. P., Carter Depot, Tenn.—Battery or machine gun. H 71. 266
- 1233 Gatling, Richard J., Hartford, Conn.—Battery gun. H 70. 266
- 1234 Witty, Calvin, New York, N. Y.—Breechloading field cannon. H 70. 266
- 1235 Nekervis, Wm., Philadelphia, Pa.—Model of Parrott gun, with caisson complete. H 72. 266
- 1236 South Boston Manufacturing Co., Boston, Mass.—Bronze and steel rifle cannon, boat howitzer. H 71. 266
- 1237 Born, B., West Medford, Mass.—Miniature field artillery, limber, and field piece. H 72. 266
- 1238 Farrington, D. W. C., Lowell, Mass.—Machine battery gun. H 72. 266
- 1239 Ferrell, John A., Bloomfield, Ky.—Model, perforated, reinforced, breechloading, heavy ordnance. H 68. 267
- 1240 Ames Manufacturing Co., Chicopee, Mass.—United States regulation, masonic, and society swords. H 72. 268
- 1241 Collins & Co., New York, N. Y.—Machetes, swords, bayonets, etc. N 67. 268

Weapons, Medical and Surgical Appliances.

- 1242 Gaylord Manufacturing Co., Chicopee, Mass.—Presentation and society swords. N 70. 263
- 1243 Wurfflein, Wm., Philadelphia, Pa.—Parlor or gallery rifles and mechanical targets. H 72. 269
- 1244 Krider, John, Philadelphia, Pa. H 72. 269
a Guns, pistols. 269
b Fishing tackle and sporting goods. 270
- 1245 Providence Tool Co., Providence, R. I.—Breechloading rifles for military, target, and sporting purposes H 72. 269
- 1246 Tryon, E. K., jr., & Co Philadelphia, Pa.—Muzzle loading rifles shot-guns, revolvers, gunmakers' tools, etc. H 70. 269
- 1247 Harder, J., & Son, Lock Haven, Pa.—Single, double, and three barrel guns. H 71. 269
- 1248 Parker Chas., Meriden, Conn.—Double-barreled breechloading shot guns. H 70. 269
- 1249 Harrington & Richardson, Worcester, Mass.—Revolving firearms with shell ejector. H 72. 269
- 1250 Burton, Bethel, Brooklyn, N. Y.—Military and sporting magazine rifles, bayonets, portable cartridge reloader. H 72. 269
- 1251 Grant & Co., Newark, N. J.—Cap rifles and targets. H 72. 269
- Medicine, Surgery, Prothesis.**
- 1252 Boericke & Tafel, Philadelphia, Pa.—Official homeopathic medical preparations, books and periodicals. N 50. 272
- 1253 Wallace Bros., Statesville, N. C.—Materia medica plants, substances, fruits, woods, mosses, etc. N 58. 272
- 1254 Seabury & Johnson, New York, N. Y.—Plasters. N 52. 272
- 1255 Mitchell, Geo. E., Lowell, Mass.—Surgical, medicinal, and pharmaceutical plasters and plaster compounds, lung protectors. N 53. 272
- 1256 Fehr, Julius, Hoboken, N. J.—Baby powder. N 52. 272
- 1257 Randle, Wm. H., Baltimore, Md.—Botanical medicines. N 52. 272
- 1258 Tims, Wm., Paterson N. J.—Homeopathic pellets. N 52. 272
- 1259 Wilson, B. O., & G. C., Boston, Mass.—Pressed medicinal herbs, leaves, flowers, seeds, roots, barks, etc. N 52. 272
- 1260 Smith's Homeopathic Pharmacy, New York, N. Y.—Homeopathic preparations in tinctures, triturations, and globules, cases for professional and family use. N 54. 272
- 1261 Ayer, J. C., & Co., Lowell, Mass.—Cherry pectoral, cathartic pills, sarsaparilla, ague cure, hair vigor. N 52. 272
- 1262 Blair's, H. C., Sons, Philadelphia, Pa. T 47. 273
a Wheat food. 273
b Fountain syringes. 274
- 1263 Hance Bros. & White, Philadelphia, Pa.—Conical plate drug mill and filtering apparatus. P 43. 274
- 1264 Bishop, Joaquin, Sugartown, Pa.—Platina crucibles, stills, bottles, wine, blowpipe tubes, ignition tubes, etc. P 49. 274
- 1265 Gilbert, Alfred A., Philadelphia, Pa.—Medicine chest and saddlebags. N 51. 274
- 1266 Hechelman, H. W., Allegheny City, Pa.—Anatomical preparations of human ear and eye. N 54. 275
- 1267 McIlroy, T., New York, N. Y.—Invalid, elevating, and fracture bedsteads, surgical operating and dissecting tables, oculists' and surgical operating chair. N 50. 276
- 1268 Condell, J., & Son, New York, N. Y.—Artificial limbs. N 58. 276
- 1269 Everett, B. C., Philadelphia, Pa.—Trusses, supporters, shoulder braces, elastic stockings, belts, and artificial limbs. N 56. 276
- 1270 Taylor, Charles F., New York, N. Y.—Orthopedic apparatus and machines for local exercise. N 52. 276
- 1271 Tiemann, Geo., & Co., New York, N. Y.—Surgical instruments and orthopedic appliances. N 51. 276
- 1272 Marks, A. A., New York, N. Y.—Artificial limbs, india rubber hands and feet. N 58. 276
- 1273 Woods, J. T., Toledo, Ohio.—Splint for leg and thigh. N 59. 276
- 1274 Pilling, Geo. P., Philadelphia, Pa.—Surgical instruments. N 52. 276
- 1275 Mervine, S. P., jr., Philadelphia, Pa.—Gynecological apparatus. N 52. 276
- 1276 Gemrig, J. H., Philadelphia, Pa.—Surgical instruments and appliances. N 57. 276
- 1277 Perry, Vincent, Germantown, Pa.—Elastic bandages for surgical purposes. N 57. 276
- 1278 National Surgical Institute, Indianapolis, Ind.—Surgical and mechanical appliances, splints, operating chairs, crutches, supporters, and trusses. N 56. 276
- 1279 Penfield, E. C., & Co., Philadelphia, Pa.—Trusses, etc. N 59. 276
- 1280 Elastic Truss Co., New York, N. Y.—Elastic trusses and abdominal supporters. N 56. 276
- 1281 Blanck, Wm., & Son, Philadelphia, Pa.—Artificial limbs and appliances. N 58. 276
- 1282 Bradford, H. W., Randolph, Mass.—Litholycite; instrument for dissolving calculi. N 51. 276
- 1283 Leiner, Moritz, New York, N. Y.—Surgical instruments. T 46. 276
- 1284 Rhodes, Isaac M., Hancock, Mich.—Easy chair, invalid bed, and fracture apparatus combined. N 59. 276
- 1285 Clement, Richard, Philadelphia, Pa.—Artificial limbs. N 58. 276
- 1286 Horn, W. H., & Bro., Philadelphia, Pa.—Trusses, abdominal supporters, etc. N 59. 276
- 1287 Darrach, S. A., East Orange, N. J.—Wheel crutch and attachments; vulcanized rawhidespinesupport. N 58. 276
- 1288 Goodier, John, Philadelphia, Pa.—Lever and shield trusses, etc. N 58. 276

Medical and Surgical Appliances, Tools.

- 1289 Crandall, Chas. J., New York, N. Y.—Crutches. N 56. 276
- 1290 Woolley, G. W., Philadelphia, Pa.—Gynæcological apparatus. N 53. 276
- 1291 Hinkle & Mayon, San Francisco, Cal.—Surgical and mechanical appliances, splints, operating chairs, crutches, supporters, and trusses. N 56. 276
- 1292 Handy & Boland, Atlanta, Ga.—Surgical and mechanical appliances, splints, operating chairs, crutches, supporters, and trusses. N 56. 276
- 1293 Kolbe, D. W., Philadelphia, Pa.—Surgical and orthopedical instruments; artificial limbs. N 53. 276
- 1294 Triumph Truss Co., New York, N. Y.—Truss and supporter. N 53. 276
- 1295 Kerns, Horatio G., Philadelphia, Pa.—Surgical and dental instruments. N 56. 276
- 1296 Foster, James A., Philadelphia, Pa.—Artificial limbs. N 53. 276
- 1297 Pingree, Luther F., Portland, Me.—Artificial limbs. N 53. 276
- 1298 Otto, F. G., & Sons, New York, N. Y.—Surgical instruments and orthopedical appliances. N 53. 276
- 1299 Bartlett, Butman, & Packer, Boston, Mass.—Trusses. N 51. 276
- 1300 Frees, C. A., New York, N. Y.—Artificial limbs. N 56. 276
- 1301 Palmer, B. F., Philadelphia, Pa.—New Palmer limbs with safety socket mechanism; new automatic system for universal motion, sound, power, etc. N 54. 276
- 1302 Seeley, I. B., Philadelphia, Pa.—Hard rubber trusses, abdominal supporters, pile instruments, elastic surgical hosiery, bandages, etc. N 53. 276
- 1303 McElroy, C. J., East Cambridge, Mass.—Glass and family syringes, feeding and drinking tubes, nipple shields, medicine droppers, etc. N 51. 276
- 1304 Miller, Jas. S., Philadelphia, Pa.—Trusses and braces. N 58. 276
- 1305 Rowand, John R., Philadelphia, Pa.—Gynæcological apparatus. N 51. 276
- 1306 Burrington, H. H., Providence, R. I.—Gynæcological apparatus. N 51. 276
- 1307 Allen & Johnson, Philadelphia, Pa.—Surgical and mechanical appliances, splints, operating chairs, crutches, supporters, and trusses. N 56. 276
- 1308 Bethell, John P., Philadelphia, Pa.—Surgical and gynæcological apparatus; artificial steel leg. N 57. 276
- 1309 Philadelphia Truss Co., Philadelphia, Pa.—Trusses, supporters, shoulder braces, elastic stockings, belts; combination truss and supporter. N 57. 276
- 1310 Gunning, Thos. B., New York, N. Y.—Fractured jaw and cleft palate appliances; teeth and regulating plates, etc. N 51. 276
- 1311 Spillman, Henry, New Orleans, La.—Trusses, supporters, and shoulder braces. N 58. 276
- 1312 Davis, James T., New York, N. Y.—Artificial human eyes. N 54. 276
- 1313 Teufel, J. J., Philadelphia, Pa. N 54. 276
a Surgical instruments. 276
b Dental instruments. 277
- 1314 Codman & Shurtleff, Boston, Mass. N 57. 277
a Surgical instruments, apparatus and appliances. 276
b Dental instruments, furniture, and materials; laboratory tools, etc. 277
- 1315 Justi, H. D., Philadelphia, Pa.—Artificial teeth, tools, and materials for their manufacture. N 54. 277
- 1316 Johnson & Lund, Philadelphia, Pa.—Artificial teeth, corundum wheels, gold foil, tooth powders, amalgams, dental instruments and materials. N 59. 277
- 1317 Wardle, Thos., Philadelphia, Pa.—Artificial teeth and models. N 58. 277
- 1318 Brown, E. Parmly, Flushing, N. Y.—Gold fillings in human teeth, dentists' cases, dental improvements. N 57. 277
- 1319 White, Samuel S., Philadelphia, Pa.—Artificial teeth, instruments, chairs, dental engines, stools, lathes, brackets, spittoons, gold foils, corundum wheels, etc. N 55. 277
- 1320 White, Chas. A., Philadelphia, Pa.—Celluloid apparatus and dental flasks, process of forming sets of artificial teeth, artificial dentures. N 56. 277
- 1321 Corfield, H. C., & Co., Philadelphia, Pa.—Artificial mineral teeth. N 58. 277
- 1322 Allen, J., & Son, New York, N. Y.—Artificial dentures. N 57. 277
- 1323 Abbey, Chas., & Sons, Philadelphia, Pa.—Dentists' gold foil. N 58. 277
- 1324 Bonwill, W. G. A., Philadelphia, Pa.—Electro-magnetic mallet for filling teeth, carving marble, chasing metals, and as an autographic printing press; dental chair and engine. N 59. 277
- 1325 Taylor, J. Hare, Philadelphia, Pa.—Tooth paste, etc. N 57. 277
- 1326 Wardle, S., Cincinnati, Ohio.—Specimens of dentistry. N 58. 277
- 1327 Neall, Danl. W., Camden, N. J.—Porcelain teeth. N 57. 277
- 1328 Swallow, J. E., Hagerstown, Md.—Dentistry; dental plates, obturators, splints, artificial nose, etc. N 58. 277
- 1329 Crowther, D. W., Hagerstown, Md.—Mechanical and operative dentistry. N 58. 277
- 1330 Scott, Quincy A., Pittsburgh, Pa.—Atmospheric disk for holding artificial teeth in the mouth, dental specimens, dentrifice. N 56. 277
- 1331 Ludwig, Schmidt, & Mohl, Houston, Texas.—Enamel; specimens of teeth. N 52. 277
- 1332 Valleau, William, jr., New York, N. Y.—Gold and silver leaf, gold and platinum filling for dentists' use. N 57. 277
- 1333 Clark, H. F., Poughkeepsie, N. Y.—Artificial dentures. N 58. 277
- 1334 Cutter, Ephraim, Cambridge, Mass.—Adjustable chair for invalids. N 58. 278
- Hardware, Edge Tools, Cutlery, Metallic Products.**
- 1335 Collins & Co., New York, N. Y.—Cast steel tools; sledges. N 67. 280
- 1336 Elgin National Watch Co., Elgin, Ill.—Watchmakers' tools. P 67. 280

Tools, Hardware.

- 1337 Douglas Axe Manufacturing Co., Boston, Mass.—Axes, hatchets, adzes, picks, etc. N 68. 280
- 1338 Pugh, Job T., Philadelphia, Pa.—Screw augers and auger bits. N 72. 280
- 1339 Conard, A. J., Whitemarsh, Pa.—Cast steel wood boring implements. P 71. 280
- 1340 Elmira Nobles Manufacturing Co., Elmira, N. Y.—Carpenters' and shipwrights' tools. N 71. 280
- 1341 Quint, S. H., & Lee, Philadelphia, Pa.—Stencils, stamps, metallic pattern letters, checks, tags, etc. H 71. 280
- 1342 Carter, Edwd., Troy, N. Y.—Nickel-plated goods; planes, mechanics' tools. P 69. 280
- 1343 Stanley Rule & Level Co., New Britain, Conn.—Rules, levels, squares, and carpenters' tools. N 68. 280
- 1344 Billings & Spencer Co., Hartford, Conn.—Drop forgings, machinists' small tools, sewing machine shuttles. H 72. 280
- 1345 Eddy, Geo. M., & Co., Brooklyn, N. Y.—Fine steel band saws and tempered steel springs. N 57. 280
- 1346 Rose, Wm., & Bros., Philadelphia, Pa.—Bricklayers', plasterers', moulders', and saddlers' tools. N 72. 280
- 1347 Cotton, Alfred J., Philadelphia, Pa.—Stair hand-rail planes and double-edge routers, carpenters' moulding planes. N 69. 280
- 1348 Pratt, Jas. T., & Co., New York, N. Y.—Tool chests for amateurs or mechanics. N 68. 280
- 1349 Maltby, Curtiss, & Co., New York, N. Y.—Nail puller. B 77. 280
- 1350 Kohler, Martin, Philadelphia, Pa.—Knee-rest for tailors. N 70. 280
- 1351 Carter, Henry, New York, N. Y.—Moulders' and plasterers' tools. N 70. 280
- 1352 Sinsz, Philip, Baltimore, Md.—Glaziers' diamonds, machinery for circular and oval cutting, engravers' points, carbon tools. N 68. 280
- 1353 King, Josiah, & Son, New York, N. Y.—Planes and tools for wood workers. N 71. 280
- 1354 Booth, John, & Son, Philadelphia, Pa.—Carpenters' tools and sundries. N 69. 280
- 1355 D. R. Barton Tool Co., Rochester, N. Y.—Mechanics' edge tools. N 70. 280
- 1356 American Shovel Co., Birmingham, Conn.—Shovels and scoops. P 68. 280
- 1357 Johnson, Wm., Hedenberg Works, Newark, N. J.—Carpenters' and other mechanics' tools and hardware. N 69. 280
- 1358 Hampton, Chas. F., Ardmore, Pa.—Augers and bits. N 71. 280
- 1359 Price, M., Newark, N. J.—Axes and edge tools. P 71. 280
- 1360 White, Wm., Newark, N. J.—Axes, hatchets, adzes, bush hooks, stone hammers, picks, etc.; carriage shaft couplings. P 71. 280
- 1361 Selsor, Geo., & Co., Philadelphia, Pa.—Hammers, edge and railroad tools, coffee mills, saw cutters, tacks, and nails. N 68. 280
- 1362 Star Tool Co., Middletown, Conn.—Machinists' and carpenters' tools; squares, bevels, gauges, rules, etc.; blind trimmings. P 67. 280
- 1363 Snell Manufacturing Co., Fiskdale, Mass.—Augers, auger bits, and boring machines. P 71. 280
- 1364 Buck Bros., Riverlin Works, Milbury, Mass.—Shank and socket firmer chisels and gouges, plane irons, screw drivers, nail sets, etc. N 69. 280
- 1365 Maydole, D., & Co., Norwich, N. Y.—Cast steel hammers. N 71. 280
- 1366 Newlin & Yardley, Philadelphia, Pa.—Steel shovels, wood screws, and foundry sieves. N 68. 280
- 1367 Davis Level and Tool Co., Springfield, Mass.—Adjustable levels and planes and iron planes. P 71. 280
- 1368 DeWitt, Morrison, & Kelley, Philadelphia, Pa.—Carpenters', millwrights', gasfitters', pump, and car builders' machine and auger bits. P 71. 280
- 1369 Shepherd & Lloyd, Philadelphia, Pa.—Scales, glass cutters, lard presses, and hardware specialties. N 71. 280
- 1370 Rowland, B., & Co., Philadelphia, Pa.—Shovels, spades, and scoops; draining and ditching tools. N 71. 280
- 1371 Yerkes & Plumb, Philadelphia, Pa.—Edge tools, hammers; railroad, mining, and blacksmiths' sledges. N 70. 280
- 1372 Bailey, Leonard, & Co., Hartford, Conn.—Bench planes, try squares, bevels. N 68. 280
- 1373 Mayo, M. C., Boston, Mass.—Plane. P 71. 280
- 1374 Middleboro' Shovel Co., Boston, Mass.—Shovels and spades. P 72. 280
- 1375 Bemis & Call Hardware & Tool Co., Springfield, Mass.—Machinists' tools. N 69. 280
- 1376 Clark, Wm. A., Westville, Conn.—Expansive bits, meat tenderers, screw drivers. N 70. 280
- 1377 Ives, W. A., & Co., New Haven, Conn.—Wood boring implements, bit braces. N 70. 280
- 1378 Mills, E., & Co., Philadelphia, Pa.—Braces, bits, bevels, screw drivers, spokeshaves, squares, and saw pads. P 68. 280
- 1379 Donaldson, J. W., Massillon, Ohio.—Block stamps for stamping garments for braiding and embroidery. P 68. 280
- 1380 Bailey Wringing Machine Co., New York, N. Y.—Metallic bench planes, spokeshaves, box scrapers, etc. N 69. 280
- 1381 Klein, Logan, & Co., Birmingham Tool Manufactory, Birmingham, Pa.—Picks, mattocks, fire shovels, etc. N 71. 280
- 1382 Crossman, A. W., & Son, West Warren, Mass.—Carpenters' hand tools. N 70. 280
- 1383 Metallic Plane Co., Auburn, N. Y.—Iron planes. H 71. 280
- 1384 Ohio Tool Co., Columbus, Ohio.—Planes, screws, edge tools, plane irons, handles, etc. N 71. 280
- 1385 Palmer, Wm. F., San Francisco, Cal.—Edge tools. N 70. 280
- 1386 Taylor, Thomas, Providence, R. I.—Bloodstone burnishers. N 71. 280

Tools, Hardware, Cutlery.

- 1387 Smyth & Pennington, Paterson, N. J.—Files and rasps. N 69. 280
- 1388 Whitney Manufacturing Co., South Ashburnham, Mass.—Tools used in manufacturing chairs. V 49. 280
- 1389 Franklin, Mrs. Esther P., Philadelphia, Pa.—Marking stencils and branding irons. T 58. 280
- 1390 Sandusky Tool Company, Sandusky, Ohio.—Planes, plane irons, bench and hand screws, chisel and file handles. P 70. 280
- 1391 Hopkins, C., Waltham, Mass.—Watchmakers' tools. N 58. 280
- 1392 Tower, John J., New York, N. Y. N 68.
a Carpenters' planes, wrenches, adjustable clamps. 280
b Handcuffs and police implements, padlocks. 284
- 1393 Harrison & Kellogg, Troy, N. Y. N 68.
a Screw wrenches. 280
b Plain, tinned, japanned, and nickel-plated malleable iron castings. 283
- 1394 Wills, Edwin S., Philadelphia, Pa. N 69.
a Tools. 280
b Wood screws, etc. 284
- 1395 Miller's Falls Co., Miller's Falls, Mass. P 71.
a Mechanics' tools. 280
b Hardware. 284
- 1396 Lloyd, Supplee, & Walton, Philadelphia, Pa. P 70.
a Hollow auger, spokeshave. 280
b Locks. 284
- 1397 Vatterlein, John, Plainfield, N. J. N 69.
a Carpenters' gauges. 280
b Gate hardware. 284
- 1398 Lowentrant, P., Newark, N. J. N 70.
a Mechanics' tools. 280
b Hardware. 284
- 1399 Hart, Bliven, & Mead Manufacturing Co., New York, N. Y. P 70.
a Carpenters' tools. 280
b Carpenters', saddlers', and carriage hardware. 284
- 1400 Hotchkiss's Sons, Bridgeport, Conn. N 72.
a Hand drills, saw sets, currycombs. 280
b Pruning shears. 281
c Harness snaps, bull rings. 284
- 1401 Beaver Falls Cutlery Co., Beaver Falls, Pa.—Table, pocket, and miscellaneous cutlery. N 70. 281
- 1402 Barney, E. H., Springfield, Mass.—Skates, perforating stamp, show case and counter combined. P 68. 281
- 1403 Will & Finck, San Francisco, Cal.—California carving sets and cutlery, bar tools. P 71. 281
- 1404 Union Hardware Co., Wolcottville, Conn.—Skates, skate straps, tool handles, wood turning, dog collars, etc. N 69. 281
- 1405 Badger, Benj. F., Charlestown, Mass.—Razor strops. N 72. 281
- 1406 Goldschmidt, Herrmann, New York, N. Y.—Razor strops. N 71. 281
- 1407 Florence Sewing Machine Co., Florence, Mass.—Skates. N 71. 281
- 1408 Herder, L., & Son, Philadelphia, Pa.—Shears and scissors. N 69. 281
- 1409 Russell, John, Cutlery Co., Green River Works, New York, N. Y.—Table cutlery, butchers', hunters', painters', and druggists' knives, etc. N 67. 281
- 1410 Shipley, Howard W., Philadelphia, Pa.—Pocket cutlery. P 71. 281
- 1411 Seymour, Henry, & Co., New York, N. Y.—Tailors', bankers', and sheep shears, trimmers, and scissors. N 71. 281
- 1412 Evans, W. D., & Co., Philadelphia, Pa.—Razor strops and oilstone hone. N 72. 281
- 1413 Meriden Cutlery Co., New York, N. Y.—Table cutlery. N 69. 281
- 1414 Holley Manufacturing Co., Lakeville, Conn.—Pocket cutlery. P 71. 281
- 1415 Lawson & Goodnow Manufacturing Co., Shelburne Falls, Mass.—Table and butchers' cutlery. N 70. 281
- 1416 United States Steel Shear Co., West Meriden, Conn.—Solid cast steel scissors and shears. N 71. 281
- 1417 Miller Bro. Cutlery Co., West Meriden, Conn.—Pocket cutlery. N 70. 281
- 1418 Heinisch's, R., Sons, Newark, N. J.—Tailors' shears, scissors, and trimmings. N 69. 281
- 1419 Wiss, J., Newark, N. J.—Cutlery, shears, and scissors, hand and pole pruning shears. P 68. 281
- 1420 Hunt, W., & Co., Philadelphia, Pa.—Razor strops. N 70. 281
- 1421 Friedman & Lauterjing, New York, N. Y.—Razors. N 72. 281
- 1422 Hessenbruch, Thos., & Co., Philadelphia, Pa.—Welded and forged cast steel shears and scissors. P 68. 281
- 1423 Robbins, Clark, & Biddle, Philadelphia, Pa.—Cutlery. N 43. 281
- 1424 Gesswein & Reichhelm, New York, N. Y.—Polishing implements and materials. N 70. 281
- 1425 Northfield Knife Co., Northfield, Conn.—Pocket cutlery. N 71. 281
- 1426 Breeden & Nelke, New York, N. Y.—Spring scissors and shears. P 71. 281
- 1427 Star Knife Co., Taunton, Mass.—Knives and cutlery. N 70. 281
- 1428 Marx Bros., New York, N. Y.—Folding pocket scissors. N 69. 281
- 1429 Winslow, Saml., Worcester, Mass.—Skates. H 71. 281
- 1430 Walden Knife Co., Walden, N. Y.—Pocket cutlery. N 68. 281
- 1431 Willis, Aug. L., Philadelphia, Pa.—Ice creper. H 71. 281
- 1432 Peck & Snyder, New York, N. Y.—Skates. H 71. 281
- 1433 New York Knife Co., Walden, N. Y.—Table, pen, and pocket cutlery, pruning knives. N 68. 281
- 1434 Mitchell, J. E., Philadelphia, Pa.—Carpenters', engravers', opticians', and cutlers' grindstones; oil stones, razor hones, etc. P 67. 282

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Building Hardware, Castings, Hollowware.

- 1435 Baeder, Adamson, & Co., Philadelphia, Pa. N 63.
 a Sand and emery paper, emery cloth, emery, corundum, flint. 282
 b Glue. 652
 c Curled hair. 669
- 1436 Harrison, W. H., & Bros., Philadelphia, Pa.—Low and elevated firegrates, fenders, fire places, etc. T 52. 283
- 1437 Dixon, Thos. S., & Sons, Philadelphia, Pa.—Grates, fenders, fireplace fittings, and gas logs. T 49. 283
- 1438 Jackson, Wm. H., & Co., New York, N. Y.—Grates, fenders, fireplaces, fire irons, and fancy coal boxes. N 67. 283
- 1439 Lalance & Grosjean Manufacturing Co., New York, N. Y.—Stamped iron culinary ware. T 68. 283
- 1440 Reyburn, Hunter, & Co., Philadelphia, Pa.—Weather vanes. N 62. 283
- 1441 Tin Plate Decorating Co., New York, N. Y.—Decorated tin plates, boxes, cans, etc. N 70. 283
- 1442 Miller & Krips, Philadelphia, Pa.—Plain and ornamental bronze; white bronze, brass, German silver, and zinc castings. P 72. 283
- 1443 Demuth, Wm., & Co., New York, N. Y.—Smokers' articles and show figures of metal and wood. P 69. 283
- 1444 Mott, J. L., Iron Works, New York, N. Y.—Fountain, zinc statuary, ornamental iron work for gardens and public parks. N 54. 283
- 1445 Rousseau, David, New York, N. Y.—Domestic bells. N 65. 283
- 1446 Woods, Sherwood, & Co., Lowell, Mass.—White lustral wire ware, plated wire, household and fancy goods. N 72. 283
- 1447 Ansonia Brass and Copper Co., Ansonia, Conn.—Brass kettles. N 57. 283
- 1448 Rohrman, J. Hall, & Son, Philadelphia, Pa.—Tea, coffee, and spice caddies; water coolers and decorated japanned tinware. P 70. 283
- 1449 Hussey, C. G., & Co., Pittsburgh, Pa.—Copper sheet, circle and bottoms; planished and ingot copper, copper lighting rods, sheet brass, brass kettles. N 72. 283
- 1450 Champion Fence Co., Kenton, Ohio.—Wrought and malleable iron fence and gate. (*Ohio State Building.*) 283
- 1451 Bevin Bros. Manufacturing Co., East Hampton, Conn. N 72.
 a Bell metal kettles. 283
 b Bells. 284
- 1452 United States Lock Co., Boston, Mass.—Locks. P 72. 284
- 1453 Yale Lock Manufacturing Co., Stamford, Conn.—Locks, ornamental bronze hardware, post office boxes. P 72. 284
- 1454 Stewart & Mattson, Philadelphia, Pa.—Building hardware, locks, door knobs, and trimmings. N 69. 284
- 1455 Nock, Geo. W., Philadelphia, Pa.—Locks and padlocks. N 70. 284
- 1456 Trenton Lock and Hardware Co., Philadelphia, Pa.—Patent lever and spring, with corrugated bolt door locks, latches, knobs, and other hardware. N 68. 284
- 1457 Shannon, J. B., Philadelphia, Pa.—Hand-made locks and building hardware. N 72. 284
- 1458 Wells & Hope Co., Philadelphia, Pa.—Metallic show cards and advertising signs, decorative glass printing, etc. P 72. 284
- 1459 Corbin, P., & F., New Britain, Conn.—House trimmings and miscellaneous hardware. N 72. 284
- 1460 American Stair Rod Co., New York, N. Y.—Stair rods and stair carpet fasteners. N 71. 284
- 1461 Stanley Works, New Britain, Conn.—Wrought iron butts, japanned, bronzed, and plated; hinges, door bolts, etc. P 71. 284
- 1462 Globe Nail Co., Boston, Mass.—Machine made horseshoe nails. N 71. 284
- 1463 Tuchfarber, F., & Co., Cincinnati, Ohio.—Enameled iron show cards. P 72. 284
- 1464 Wiler, Wm., Philadelphia, Pa.—Stair rods and plates. N 71. 284
- 1465 Walton, E. S., & Co., Philadelphia, Pa.—Lock hardware and fine bronze work. N 72. 284
- 1466 Amwake, Wm. F. H., & Bro., Lancaster city, Pa.—Padlocks, shoulder shackles. P 72. 284
- 1467 Dunbar, Hobart, & Whidden, South Abington, Mass.—Tacks, brads and nails, steel shanks, heel plates, etc. P 72. 284
- 1468 Hildebrand & Wolf, Philadelphia, Pa.—Trunk locks, padlocks, dead-latches, door springs, etc. P 69. 284
- 1469 Carr, Crawley, & Devlin, Philadelphia, Pa.—Building, cabinet, carriage, and saddlery hardware; malleable iron, brass, and steel castings. N 70. 284
- 1470 Hall's Safe and Lock Co., Cincinnati, Ohio.—Bank and time locks. H 67. 284
- 1471 Whitaker & Skirm, Trenton, N. J.—Iron chains, chute and sheathing nails. N 69. 284
- 1472 Gould's, M., Sons, New York, N. Y.—Stair rods, step plates, dog collars, upholstery and trunk hardware. N 71. 284
- 1473 Morton, Thos., New York, N. Y.—Sash chain and attachments for suspending windows, doors, etc. T 49. 284
- 1474 Mallory, Wheeler, Co., New Haven, Conn.—Door locks and knobs, padlocks, etc. N 69. 284
- 1475 Gaylord Manufacturing Co., Chicopee, Mass.—Cabinet locks. N 70. 284
- 1476 Union Manufacturing Co., New Britain, Conn.—Plain and ornamental butt hinges. N 68. 284
- 1477 Mersereau, W. T., & I., Newark, N. J.—Stair rods and plates, dog collars and muzzles, bridle fronts, and upholsterers' hardware. N 71. 284
- 1478 American Lock Manufacturing Co., Cazenovia, N. Y.—Locks and latches. N 72. 284
- 1479 Bohannon, Wilson, Brooklyn, N. Y.—Brass spring padlocks and car locks. P 68. 284
- 1480 Union Steel Screw Co., Cleveland, Ohio.—Bessemer steel wood screws, with samples showing stages of manufacture. T 59. 284

Building Hardware, Bells, Locks.

- 1481 Clark & Co., Buffalo, N. Y.—Nickel-plated builders' hardware. N 71. 284
- 1482 Van Wagoner & Williams, New York, N. Y.—Hinges and door springs. N 70. 284
- 1483 Gong Bell Manufacturing Co., East Hampton, Conn.—Bells. P 72. 284
- 1484 Romer & Co., Newark, N. J.—Locks for railroad switches, cars, prisons, stores, etc. N 71. 284
- 1485 Cowell, J. J., & Co., Newark, N. J.—Builders' and trunk hardware. N 71. 284
- 1486 Middletown Tool Co., Middletown, Conn.—Plane irons, harness suaps, washer cutters, hitching chains, plane-makers' hardware, etc. P 71. 284
- 1487 Slight, Thos., Newark, N. J.—Padlocks, brass and iron locks, and car trimmings. P 68. 284
- 1488 Van Arsdale, M. F., Newark, N. J.—Plumbers' brass and plated goods; faucets. P 68. 284
- 1489 Samuel, Wilkins, & Orcutt Manufacturing Co., New York, N. Y.—Burglar alarms, etc. P 68. 284
- 1490 Tiebout, W., & J., New York, N. Y.—Brass, galvanized, and ship chandlery hardware. H 68. 284
- 1491 Phoenix Lock Works, Newark, N. J.—Locks, small hardware, patented articles, keys, etc. P 68. 284
- 1492 Thorn, Stephen S., Newark, N. J.—Brass and iron wire ferrules for paint brushes; bonnet and insulating wire. N 69. 284
- 1493 Worrell Bank Lock Manufacturing Co., Philadelphia, Pa.—Bank lock. H 70. 284
- 1494 Ougheltree, Geo., Newark, N. J.—Bag and satchel frames. P 68. 284
- 1495 Winn, Henry, Shelburne Falls, Mass.—Key locks. N 70. 284
- 1496 Herring & Co., New York, N. Y.—Bank locks. H 69. 284
- 1497 Neuman, R., & Co., Newark, N. J.—Satchel and traveling bag frames and bag trimmings. P 71. 284
- 1498 Van Alen & Co., Northumberland, Pa.—Cut nails and spikes. T 66. 284
- 1499 Blake Bros. Hardware Co., New Haven, Conn.—Hardware for builders', cabinet makers', and carriage makers' use. P 69. 284
- 1500 Miller, D. K., Lock Co., Philadelphia, Pa.—Locks. P 70. 284
- 1501 Eagle Lock Co., Terryville, Conn.—Trunk and cabinet locks. H 67. 284
- 1502 Judd, Hubert L., New York, N. Y.—Upholstery and fancy hardware. N 69. 284
- 1503 Coleman Eagle Bolt Works, Philadelphia, Pa.—Carriage bolts, nuts, and axle clips. P 71. 284
- 1504 Meeker, D. M., & Son, Newark, N. J.—Iron, bronze, and German silver castings. N 71. 284
- 1505 Miller, Edward, & Co., Meriden, Conn.—Tinner's hardware. N 48. 284
- 1506 Norwalk Lock Co., South Norwalk, Conn.—Door locks, knobs, padlocks, and builders' hardware. N 70. 284
- 1507 Terwilliger & Co., New York, N. Y.—Safe locks. H 72. 284
- 1508 Miller, Samuel, Gratis Post Office, Ohio.—Bank, safe, and permutation locks, combination door lock and latch, hame fasteners. N 70. 284
- 1509 Wheeling Hinge Co., Wheeling, W. Va.—Hinges, butts, wrought goods, and washers. N 68. 284
- 1510 Hiler, S., New York, N. Y.—Glass, porcelain, and mineral door knobs and mountings. N 71. 284
- 1511 Vanduzen & Tift, Cincinnati, Ohio.—Bells. T 53. 284
- 1512 American Screw Co., Providence, R. I.—Gimlet pointed screws of iron, brass, and steel; coach, hand rail, and machine screws; rivets; stove and tire bolts. P 69. 284
- 1513 Branford Lock Works, New York, N. Y.—Rim and mortise door locks and latches, brass and steel keys, door knobs, lock furniture. P 69. 284
- 1514 Easton Lock Works, Easton, Pa.—Rim and mortise locks and latches; safety locks and night latches. N 72. 284
- 1515 Lehigh Shovel Works, Bethlehem, Pa.—Shovel handle and blade. T 71. 284
- 1516 Wallace & Sons, Ansonia, Conn.—Brass and copper wire, rivets, and burrs; brass pins. P 68. 284
- 1517 Evans, F. H., Brooklyn, N. Y.—Expansion bolts and screw fastenings; photographs of other manufactures. P 69. 284
- 1518 American Tack Co., Fairhaven, Mass.—Tacks and nails. N 72. 284
- 1519 Field, A., & Sons, Taunton, Mass.—Tacks, brads, nails, etc. P 68. 284
- 1520 Valentine & Butler Safe & Lock Co., New York, N. Y.—Safe locks. H 70. 284
- 1521 Lewis, Oliver, & Phillips, Pittsburgh, Pa.—Wagon and heavy hardware, fence pickets, etc. T 64. 284
- 1522 New Britain Lock Co., New Britain, Conn.—Key register; dial, bank, safe, and time locks. N 72. 284
- 1523 American Wire & Screw Nail Co., Covington, Ky.—Wire and wire screw nails. P 71. 284
- 1524 Buckman, Ira, Brooklyn, N. Y.—Torsion spring hinge. N 68. 284
- 1525 Mosler Safe and Lock Co., Cincinnati, Ohio.—Safe locks. H 69. 284
- 1526 Turner & Seymour Manufacturing Co., Walcottville, Conn.—Brass and iron upholstery goods and hardware, and notion goods. N 68. 284
- 1527 Sargent & Greenleaf, Rochester, N. Y.—Chronometer, bank, safe, and flat key locks. H 72. 284
- 1528 Wilcox, Wm., Manufacturing Co., Middletown, Conn.—Padlocks, plate locks, and keys. N 71. 284
- 1529 King, J. M., & Co., Waterford, N. Y.—Stocks and dies, plug and taper taps, pliers, etc. N 71. 284
- 1530 Keyless Padlock Co., New York, N. Y.—Keyless padlocks. N 70. 284
- 1531 Lyon, Sylvanus, New York, N. Y.—Locks. N 72. 284
- 1532 Johns, H. W., New York, N. Y.—Tacks, etc. P 47. 284

Iron and Rubber Goods, Brushes, Cordage, Paper and Woodenware.

- 1533 Barton, W. E., East Hampton, Conn.—Bells. N 71. 284
- 1534 Clarke Combination Lock Co., Baltimore, Md.—Combination keyless locks. P 68. 284
- 1535 Williamson, Wm., and Orbeton, S., Boston, Mass.—Screw braces and hinges. N 68. 284
- Fabrics of Vegetable, Animal, or Mineral Materials.**
- 1536 Glendale Elastic Fabrics Co., Easthampton, Mass.—Woven and braided elastic rubber fabrics. F 68. 285
- 1537 Easthampton Rubber Thread Co., Easthampton, Mass.—India rubber thread and rubber in process of manufacture. F 68. 285
- 1538 Willis, Aug. L., Philadelphia, Pa.—Rubber rails for tracks. H 71. 285
- 1539 Sellers, Chas. P., Philadelphia, Pa.—Corn brooms and whisks. T 46. 286
- 1540 Reynolds, C. T., & Co., New York, N. Y.—Brushes. P 42½. 286
- 1541 Leiner, Moritz, New York, N. Y.—Brushes. T 46. 286
- 1542 Lovell, G. H., & M. F., Philadelphia, Pa.—Ear brush. T 50. 286
- 1543 Miles, Bros., & Co., New York, N. Y.—Brushes. N 69. 286
- 1544 Grand Rapids Brush Co., Grand Rapids, Mich.—Brushes. N 72. 286
- 1545 Clinton, E., & Co., Philadelphia, Pa.—Brushes. N 66. 286
- 1546 Bowman, C. A., & Bro., Madison, Ind.—Clothes brushes made of broom corn. T 46. 286
- 1547 Johns, H. W., New York, N. Y.—Brushes. P 47. 286
- 1548 Florence Manufacturing Co., Florence, Mass.—Hair brushes. B 70. 286
- 1549 Richmond, Henry, New York, N. Y.—Brushes. N 68. 286
- 1550 Bailey, John T., & Co., Philadelphia, Pa.—Rope and twines. B 68. 287
- 1551 Baumgardner, Woodward, & Co., Philadelphia, Pa.—Cordage and clothes lines, tarred yarns, hemp packing. B 68. 287
- 1552 Vyse, Robt. H., Brooklyn, N. Y.—Rawhide rope, sash cord, and round belting. B 68. 287
- 1553 Hooper, Wm. E., & Sons, Baltimore, Md.—Cotton rope, twine, and netting. D 78. 287
- 1554 Hart, A. H., & Co., New York, N. Y.—Twines, shoe threads, etc. B 68. 287
- 1555 Wall's, William, Sons, New York, N. Y.—Ships' rigging; rope and cordage. D 78. 287
- 1556 Tucker, Carter, & Co., New York, N. Y.—Wire and manilla ropes. B 69. 287
- 1557 Hart, Clarence A., Philadelphia, Pa.—Painted silk banners. P 64. 288
- 1558 Lilley, M. C., & Co., Columbus, Ohio.—Masonic goods and society supplies. P 65. 288
- 1559 Wilson, J. H., Philadelphia, Pa.—Regalias, flags, and banners. F 70. 288
- 1560 New England Bunting Co., Lowell, Mass.—Bunting. B 75. 288
- 1561 Salisbury & Co., New York, N. Y.—Muslin flags; engraving, designing, lithographing, and printing. H 77. 288
- 1562 Piton, Camille, Philadelphia, Pa.—Trophies representing America, Europe, Asia, and Africa. (*Nave and Centre Transept.*) 288
- 1563 Tremain, Chas., Manlius, N. Y.—Paper barrels; cheese and fruit packages. T 57. 289
- 1564 Trasel, Edwd. G., New York, N. Y.—Papier maché household ware, chamber sets, pails, cuspadores, etc. P 64. 289
- 1565 Wakefield Rattan Co., Boston, Mass.—Rattan baskets. T 57. 289
- 1566 Allen, Jas. M., Co., New York, N. Y.—Druggists' turned wood boxes. T 43. 289
- 1567 Waters, E., & Sons, Troy, N. Y.—Boat barrels, camp stools, seats, packages for volatile liquids, etc., made of paper. B 73. 289
- 1568 Jennings Bros., New York, N. Y.—Japanese paper ware. T 68. 289
- 1569 Preston & Merrill, Boston, Mass.—Wooden boxes. P 48. 289
- 1570 Dorman Manufacturing Co., New York, N. Y.—Baskets, urns, carriage bodies, etc. P 59. 289
- 1571 Paxson, Comfort, & Co., Philadelphia, Pa.—Burial robes and dresses; casket trimmings. B 73. 290
- 1572 Smith, Wm. M., West Meriden, Conn.—Casket trimmings, handles, name plates, and ornaments. N 43. 290
- 1573 Rogers, C., & Bros., West Meriden, Conn.—Gold and silver plated coffin and casket trimmings. F 72. 290
- 1574 Chase, F., & P. F., Penn Galvanic Works, Philadelphia, Pa.—Galvanized iron goods, sheet iron, water pipe, boilers, hardware, shipsmithing, railings; bar, hoop, and chain iron. P 68. 291
- 1575 Straus, J. E., & Co., Philadelphia, Pa.—Galvanized, wrought, and cast iron work. P 71. 291
- 1576 Wilson, Parsons, & Co., Bridgeport, Conn.—Zinc monuments and shafts for cemeteries. (*Outside.*) 291
- 1577 Philadelphia Galvanizing Co., Philadelphia, Pa.—Galvanized sheet iron pipe, railing, wirework, chairs, boilers, sinks, coal hods, etc. P 69. 291
- 1578 Kittredge Cornice and Ornament Co., Salem, Ohio.—Sheet metal cornices, doors, shutters, and pavilion; architectural ornaments, light wrought iron work. (*Outside.*) 291
- 1579 Falstrom & Tomqvist, Passaic city, N. J.—Galvanized iron cornice and ornamental sheet iron work for buildings. P 68. 291
- 1580 Philadelphia Architectural Iron Co., Philadelphia, Pa.—Galvanized iron and sheet zinc gate entrance. P 70. 291
- 1581 McCullough Iron Co., Philadelphia, Pa.—Galvanized sheet iron. P 70. 291
- 1582 Brown & Owen, Philadelphia, Pa.—Cemetery inclosure, ornamental iron work, and wrought iron pipe. (*Outside.*) 291
- 1583 Cornell, J. B., & J. M., New York, N. Y.—Cast and wrought iron work for buildings and bridges, girders, columns, stairs, railings, lampposts. P 70. 291
- 1584 Marshall Brothers & Co., Philadelphia, Pa.—Galvanized and leaded sheet iron work. P 71 and *Outside.* 291

Builders' Iron Work, Vehicles.

1585 Zinc Roofing and Ornamenting Works, Chicago, Ill.—Ornaments in pressed and cast zinc, brass, and copper; zinc statues, emblematic signs, etc. P 69. 291

1586 Buringer Brothers, Dayton, Ohio.—Ohio coat of arms of galvanized iron. (*In gable of Ohio State Building.*) 291

Carriages, Vehicles, and Accessories.

1587 Blake Bros. Hardware Co., New Haven, Conn.—Trucks for moving open barrels and kegs. P 69. 294

1588 Newichawanick Co., South Berwick, Me.—Horse blankets and goods for horse clothing. R 78. 296

GREAT BRITAIN.

(North of Nave, Columns 23 to 38.)

Chemicals, Oils, Soap, Candles.

Chemical Manufactures.

- 1 Hutchinson, John, & Co., Widnes, Lancashire.—Soda ash, soda crystals, caustic soda, bicarbonate of soda, salt cake, bleaching powder, and sulphur recovered from vat waste. 200
- 2 Corbett, John, Stoke Prior Salt Works, Worcestershire.—Refined salt. 200
- 3 Richards, Kearne, & Gasquoine, Mal-kins Bank Alkali Works, Sandbach, Cheshire.—Brine, sulphate of ammonia, soda ash, bicarbonate of soda. 200
- 4 Gaskell, Deacon, & Co., Widnes, Lancashire.—Carbonated soda ash, and refined alkali, bleaching powder, soda crystals, bicarbonate of soda, and chloride of calcium. 200
- 5 Brunner, Mond, & Co., Northwich, Cheshire.—Alkali and bicarbonate of soda. 200
- 6 The Desoto Alkali Co. (limited), Widnes, Lancashire.—Caustic soda, and black ash or ball soda. 200
- 7 Weldon, Walter, Merton, London.—Samples and models of apparatus, illustrative of the manufacture of chlorine. 200
- 8 Runcorn Soap and Alkali Co. (limited), Liverpool.—Bleaching powder, soda ash, crystals of soda, caustic soda, and refined resin. 200
- 9 Muspratt Brothers, & Huntley, Liverpool.—Soda ash, caustic soda, bleaching powder, soda crystals, and bicarbonate of soda. 200
- 10 Muspratt, James, & Sons, Liver-
pool.—Soda ash, cream caustic soda, bleaching powder, chlorate of potash, salt cake, and brimstone. 200
- 11 Tyne Vale Chemical Co., Northum-
berland Works, Newcastle-on-Tyne.—Pure and methylated ether, pure and methylated chloroform, sweet spirit of nitre, pure and commercial chemicals. 200
- 12 Spence, Peter, Manchester.—Cry-
stallized alum, in block and crystals, and a new alumino-ferric compound for precipi-
tating sewage and for paper making. 200
- 13 Higgin, Thomas, & Co., Liverpool.—
Salt. 200
- 14 The Newcastle Chemical Works
Co. (limited), Newcastle-on-Tyne.—Soda
ash, alkali, bleaching powder, crystals and
bicarbonate of soda, caustic soda, chloride
of calcium. 200
- 15 White, John & James, Shawfield
Works, Glasgow.—Bichromate of pot-
ash. 200
- 16 Liver Alkali Works Co. (limited),
Liverpool.—Caustic soda. 200
- 17 Young, James, Kelly, Wemyss Bay,
N. B.—Illustrations of manufacture of
carbonate of soda, chlorate of potash, pro-
ducts from petroleum, coal, and shale, pre-
servation of iron ships. 200
- 18 Greenbank Alkali Co., St. Helen's,
Lancashire.—Chemical products, pure
caustic soda, chlorate potash. 200
- 19 Liver Alkali Works Co. (limited),
Liverpool.—Caustic soda. 200
- 20 Jennings, T., Brookfield Chemical
Works, Cork.—Carbonate and calcined
magnesia. 200
- 21 Calvert, F. C., & Co., Bradford,
Manchester.
a Carbolic and cresylic acids and deriva-
tives. 200
b Carbolic acid soaps. 201
- 22 Parkinson Bros., Burnley.—Baking
powder. 200
- 23 Morson & Son, London, W. C.—
General chemicals and specialties, crea-
sote, pepsine, gelatine, etc. 200
- 24 Allen & Hanburys, London.—Paté
de jujube and analogous articles. 200
- 25 Gerrard, Alfred William, London.—
Pharmaceutical preparations. 200
- 26 Kinmond & Co., Leamington.—Fluid
magnesia, and effervescing fluid citrate of
magnesia. 200
- 27 Wyndham, F., & Co., London.
—"Esprit des Œufs" (spirit of eggs), a
medicinal compound. (*In Agricultural
Hall.*) 200
- 28 Price's Patent Candle Co. (limited),
Belmont Works, London.—Candles,
night-lights, glycerine, fatty acids, ma-
chinery oils; toilet, household, and mill
soaps, glycerine, paraffine, stearine, and
tapers. 201
- 29 Field, J. C., & J., London.—Candles,
toilet soaps, beeswax, and refined yellow
wax, white wax, dyers' soaps, sealing
wax, and fancy ornamental candles. 201
- 30 Pears, A., & F., Lanadron Soap
Works, Isleworth, near London.—Trans-
parent soap. 201
- 31 Marrison, Robt. D., Norwich, Nor-
folk.—Soap powder. 201
- 32 Cohné, Sigismund, London.—Chem-
ical and medical soaps. 201
- 33 Craig & Rose, Caledonian Oil and
Color Works, Edinburgh.
a Oils. 201
b Paints and colors. 202

Oils, Pigments, Ink, Perfumery, Explosives, Ceramics.

- 34 Williams, Miles, Britannia Varnish Works, Wigan, Lancashire.**
a Gas carburettor and drawings; improvement in manufacture of gas and liquid fuel. 201
b Varnishes, varnish paints, enamels, lacquers, and specimens of work. 202
- 35 Hickisson, Mrs. M. A., London.**—Marking ink, pens, linen stretcher, and framed specimens. 202
- 36 Turner, Chas., & Son, London.**—Varnishes, fine colors, gums. 202
- 37 Adams, John, Victoria Park, Sheffield.**—Polishes for furniture, brass, and plate. 202
- 38 Lyons, William, Manchester.**—Writing and copying fluids and inks, marking ink, ink powders, paper dye tablets. 202
- 39 Bowman, Charles, London.**—Solid ink, stencil plates, stencil brushes, etc. 202
- 40 Rawlins & Son, Brook Works, Prescott.**—Ultramarine and smalts, with raw materials. 202
- 41 Chambers, T. F., Hull.**—Black varnish. 202
- 42 Johnson Brothers, Hull.**—Colors, varnishes, machinery oils, and locomotive and anti-friction greases. 202
- 43 Sands Brothers, & Co., Salford Chemical Works, Manchester.**—Writing inks, aniline dyes, and blacking inks for leather work. 202
- 44 Rowney, George, & Co., London.**—Pigments, colors, varnishes, artists' materials. 202
- 45 Storer, David, & Sons, Glasgow.**—Colors, pigments, and wood stains; Venetian, Indian, and other reds; drop black, greens, and other pigment colors. 202
- 46 Cooper & Co., London.**—Writing register, and japan inks, copying and fluid ink; red, scarlet, blue, and violet inks. 202
- 47 Silicate Paint Company, Liverpool.**—Silicate paints and colors; petrifying liquid for damp walls; enameling and anti-fouling paints; cement for steam joints, anti-incrustation fluid, nitre killer, etc. 202
- 48 Blackwood, John, & Co., London.**—Writing, copying, and indelible marking inks. 202
- 49 Mackay, John, Edinburgh.**
a Spirit varnishes and polishes for coating wood of all colors, white, mahogany, oak, or ebony. 202
b Fluid flavoring essences from spices, fruits, and vegetables. 203
- 50 Stephens, Henry Charles, London.**—Writing fluids and copying inks, ink powders, machine ruling and indorsing inks; stains for wood. 202
- 51 Crown Perfumery Company, London.**—Perfumes and toilet requisites. 203
- 52 Sturges Montserrat Company (limited), Birmingham.**—West India goods. 203
- 53 Atkinson, J., & E., London.**—Perfumery and toilet articles. 203
- 54 Jaap, John, Glasgow.**—Flavoring essences and other preparations. 203
- 55 Low, Son, & Haydon, London.**—Perfume extracts, toilet soaps. 203
- 56 Perks, Samuel, Hitchin Herts.**—Essential oil of lavender, extract lavender flowers, etc. 203
- 57 Thiellay, Eugene Henry, London.**—Hair tincture, dyes, and bleaching liquid, tonics, and cultivators. 203
- 58 Rimmel, Eugene, London.**—Perfumery and toilet articles; perfume vaporizers, etc. 203
- 59 Evans, Sons, & Co., Liverpool, and Evans, Lescher, & Evans, London.**—Perfumery. 203
- 60 Bryant & May, Fairfield Works, London.**—Safety matches, wax vestas and vesuvians, decorated metal and other boxes. 204
- 61 Eley Brothers (limited), London.**—Paper and metal cartridge cases (empty), sporting and military percussion caps, gun waddings. 204
- 62 Bickford, Smith, & Co., Tuckingmill, Cornwall.**—Safety fuses for blasting operations. 204
- 63 Pigou, Wilks, & Laurence (limited), London.**—Military, sporting, African, and mining powders of every description. 204
- 64 Lacey, Richard George, Coast Guard Station, Leigh, Essex.**—Rocket apparatus for throwing lines from one ship to another; alarm signal box for ships; fisherman's block. 204
- 65 Gage, Thomas, London.**—Rockets, and tube for firing; danger signal and distance plate; rockets and hand lights, fired without the aid of heat, light, or fire; friction tubes and reflectors; fog signals for railways. 205
- Ceramics—Pottery, Porcelain, Glass, etc.**
- 66 Peake, Thomas, The Tileries, Tunstall, Staffordshire.**—Paving and facing bricks; ridge, roofing, and flooring tiles; ornamental tiles for garden borders, skirtings, and mural decorations. 206
- 67 Hamblet, Joseph, Piercy Blue Brick Works, West Bromwich, Staffordshire.**—Vitrified blue bricks, copings, plinths, stable floor bricks, quarries, ridges, roofing tiles, and every variety of terra metallic pavings. 206
- 68 Wood & Ivery, Albion Brick Works, West Bromwich, Staffordshire.**—Blue terra metallic building and fancy bricks; mouldings, copings, footpath paving bricks, grooved stable floor bricks, terminals; terra metallic vases, trusses, etc. 206
- 69 Johnson & Co., Ditchling Potteries, Sussex.**—Terra cotta as applied to building purposes; terminals, vases, ridge tiles, and general terra cotta work. 206
- 70 Matthews, John, Royal Pottery, Weston-super-Mare, Somerset.**—Terra cotta vases, fountains, and baskets; garden pottery, etc. 206
- 71 Watcombe Terra Cotta Company (limited), Watcombe, South Devon.**—Terra cotta, painted vases and plaques, statuettes, etc.; frescoes for mural adornment, and architectural terra cotta specimens. 206
- 72 Brooke, Edward, & Sons, Fieldhouse Fire Clay Works, Huddersfield, Yorkshire.**
a Sanitary tubes. 206
b Fire bricks and clay for furnaces; sewer ventilators; silica fire bricks for furnaces. 207

Bricks, Stoneware, Terra Cotta, Porcelain, Glass.

- 73 Stiff, James, & Sons, London.**
a Terra cotta jars, bottles, tiles, vases, medallions, water filters, refrigerators, air bricks, stoves, and stove linings, tablets with figures in bas-relief, figures for church and other decorations, etc. 206
b Stoneware jugs, etc., in decorated Lambeth ware, chemical apparatus, sanitary ware, sewer traps, drain pipes, etc. 210
- 74 Jennings, George, London.**—Appliances for ventilation, terra cotta bricks, etc.; stoneware drain pipes, gulley traps. 206
- 75 Holland, William Thomas, Yrismudw, South Wales.**—Ceramic goods, earthenware or faience, in table, tea, toilet services, etc.; architectural terra cotta, ornamental bricks and tiles, fire bricks and fireproof cements, sanitary pipes and ware. 206
- 76 Lindsay & Anderson, Lilliehill Fire Clay and Terra Cotta Works, Dunfermline, Scotland.**—Fountain in terra cotta, bust and pedestal of Sir Walter Scott, statuette of Sir James Y. Simpson, nymphs at fountain, garden vases and pedestals, gas stove in terra cotta, sewage pipes and sanitary appliances, fire clay bricks, chimney eans, collection of terra cotta. 206
- 77 Doulton, Hy., & Co., London.**—Terra cotta goods for architectural and horticultural purposes; sanitary pottery in salt-glazed stoneware, queensware; colossal group of America, by John Bell, on pedestal, ornamented with art pottery; vitrified metallic bricks and pavings. 206
- 78 Brownhills Pottery Co., Tunstall.**—Earthenware, dinner, dessert, and toilet ware, jugs, etc.; enameled vases, etc.; terra cotta and black glazed ware, floor and roof tiles, ridge ornaments, etc. 206
- 79 Dean, Henry, Rugby, Warwickshire.**—Stoneware drain traps and yard gullies of different patterns. 206
- 80 Tinworth, George, London.**—Panels in terra cotta, illustrative of Scripture, and articles in colored stoneware. 206
- 81 Harper & Moores, Stourbridge.**—Fire clays, prepared clays, fire bricks, crucibles, melting pots, bricks for smelting furnaces, etc. 207
- 82 Cliff, John, Runcorn, near Liverpool.**—Fire brick. 207
- 83 Patent Plumbago Crucible Co., Battersea Works, London.**—Portable furnaces, dental work, etc.; skittle pots for glass melting; crucibles for jewelers, assayers, dentists, etc.; founders' blacking. 208
- 84 Price, J., & C., & Brothers, Bristol.**—Ale bottles, spirit jars, barrels, preserve jars, water filters, feet warmers, etc.; stoneware. 207
- 85 Bates, Walker, & Co., Dale Hall Works, Burslem.**—Dinner, dessert, toilet, and tea ware; general earthenware goods; ironmongers', artists', and gardenware; stick, parasol, and umbrella handles; spirit barrels, signboard letters, porcelain slates, menu tablets, etc. 207
- 86 Doulton & Co., London.**—Mantel-pieces, stoves, hearth, and fenders of clay; crucibles, furnaces, muffles, in fire clay and plumbago. 207
- 87 King Brothers, Stourbridge.**—Fire brick, gas retorts, etc. 208
- 88 Reynolds, John George, London.**—Pipe clays and pipes, terra cotta and fire clays; gas stoves in terra cotta, backs and cheeks for close stoves, fuel economizers, gas shades, fire bricks, water paint. 207
- 89 Davidson, T., jr., & Co., Caledonian Pipe Works, Glasgow.**—Clay tobacco pipes; white clay pipes, fitted with fancy mouthpieces and cases. 207
- 90 The Campbell Brick and Tile Co., Stoke-upon-Trent.**—Encaustic, geometrie, majolica, and all kinds of glazed tiles and mosaics, bricks, and roofings. 208
- 91 Craven, Dunill, & Co., Jackfield Works, near Ironbridge, Shropshire.**—Tiles for pavements and hearths; ornamental splays for fireplaces; tiles for walls and furniture. 208
- 92 Minton's China Works, Stoke-on-Trent.**—Enameled tiles. 208
- 93 Maw & Co., Benthall Works, Broseley, Shropshire.**—Geometrical mosaic, encaustic, and majolica tiles, architectural majolica and terra cotta. 208
- 94 Minton, Hollins, & Co., Stoke-on-Trent.**—Tiles, tile-mosaic, tile fender, chimney piece, fire grate, flower vases, etc. 208
- 95 Stanley Bros., Midland Tile Works, Nuneaton, Warwickshire.**—Perforated tiles for malt kiln floors. 208
- 96 Brown-Westhead, T. C., Moore, & Co., Cauldon Place, Staffordshire Potteries.**—China, earthenware, statuary porcelain and majolica ware; dinner, dessert, tea, and toilet services; druggists' and perfumers' goods, tiles, and sanitary ware. 208
- 97 Daniell, A. B., & Son, London.**—Porcelain and pottery, ornamental vases, candelabra, etc.; dinner, dessert, tea, and coffee services; toilette services, fountains, jardinières, garden seats, vases, etc. 210
- 98 Powell & Bishop, Hanley, Staffordshire.**—Dinner, dessert, tea, and toilet services, white granite, etc. 210
- 99 Brownfield, Wm., & Son, Cobridge, Staffordshire Potteries.**—China, majolica, ironstone china, parian, earthenware, stoneware, etc. 210
- 100 Doulton & Watts, Lambeth Pottery, London.**—Tile decorations, stoneware for domestic and manufacturing purposes, and chemical works; pulpit and font, in fine art pottery faience. 210
- 101 Mortlock, John, Pottery Galleries, London.**
a Decorative art pottery. 211
b Porcelain. 213
- 102 Edwards, John, Fenton, Staffordshire.**—Ironstone china and porcelain de terre tea, dinner, toilet, and jug services. 213
- 103 Bailey, W., & J. A., Alloa, Scotland.**—Rockingham earthenware teapots. 213
- 104 Hetley, J., & Co., London.**—Glass shades; glass used for photographic, building, and horticultural purposes. 214
- 105 Chance Bros., & Co., Glass Works, near Birmingham.**—Glass for optical instruments. 214
- 106 Kilner Bros., London.**—Glass bottles and glass for useful and scientific applications. 215

Glass, Furniture, Lighting and Heating Apparatus.

- 107 Aire and Calder Glass Bottle Co.,** London.—Glass bottles, combination stoppers, packing cases, corks, straw envelopes. 215
- 108 Green, James, & Nephew, Thames Cut Glass Works,** London.—Table glass, cut and engraved table decorations and flower stands, glass chandeliers, and lustre candlesticks. 216
- 109 Millar, John, & Co., Edinburgh.**—Engraved and cut glass. 216

Furniture and Objects of General Use in Construction and in Dwellings.

- 110 Cox & Sons,** London.—Chimney piece, embroidered mantel board, ebonized corner cupboard, carved oak furniture, bronze ornament, stained glass church window, wrought iron pulpit body, lecterns, church plate, wrought iron and brass work, art tiles and plaques; the challenge prize of the National Musical Union, etc. 217
- 111 Wright & Mansfield,** London.—Cabinet furniture of the 18th century. 217
- 112 Hems, Harry, Exeter.**—Alabaster statue; carved oak chest made out of ancient beams (nearly 600 years old) from the choir of Salisbury cathedral. 217
- 113 Peyton & Peyton, Bordesley Works,** Birmingham.—Metallic bedsteads. 217
- 114 Morton, W. Scott, & Co., Art Furniture Works,** Edinburgh.—Decorative furniture, ebonized and decorated cabinet, sideboard. 217
- 115 Hart, Son, Peard, & Co., London.**—Artistic metal work (chiefly for ecclesiastical purposes), gas fixtures, stove-grates, etc. 217
- 116 Shoolbred, James, & Co., London.**—Furniture in the Jacobean and Queen Anne styles; bedroom furniture in the Anglo-Indian style; curtains and carpets. 217
- 117 Barnard, Bradley,** London.—Furniture and hammock, bassinets, baskets, etc. 217
- 118 Cooper & Holt,** London.—Furniture, sideboard, portion of bedroom suite, decorative drawing-room furniture. 217
- 119 Phipson, Miss Emma, Monk Sherborne,** Basingstoke, Hants.—Sideboard, ladies' work table, dressing glass, and candlesticks. 217
- 120 Ward & Co., London.**—Bear arranged as dumb waiter to hold tray and lamp. 217
- 121 Schildberg, H., & Co., London.**—Writing desks, ornamental fountains. 217
- 122 Arthur, Frederick,** London.—Cabinet work and fittings for Royal School of Art needlework exhibits. 217
- 123 Wethered, Edwin Robert,** Woolwich, Kent.—Hammock, friction pulley block exhibited as a fire escape. 217
- 124 Matthew, Edward,** London.—Stained glass windows, mural brasses, decorative tiles. 217
- 125 Barnard, Bishop, & Barnards,** Norfolk Iron Works, Norwich.—Ornamental wrought and cast iron gates, palisade, pavilions, etc., lawn mowers, wire netting, hose reels, garden rollers, iron garden requisites, stoves, mangles, etc. 217
- 126 Singer, J. W., & Son, Frome, Somerset.**—Artistic metal work, altar crosses and candlesticks, alms dishes, and mural brass plates for churches. 217
- 127 Knight, Miss Mary,** London.—Bedstead. 217
- 128 Jeffreys, Charles,** London.—Show cases, cut glass mirror, leather traveling and jewel cases, bronzed shop fittings, show stands, reflecting lamps, morocco and velvet cases. 217
- 129 Royal School of Art Needlework,** London.—Artistic needlework and embroidery in applique, crewels, and silk. 217
- 130 Elkington & Co., London.**—Works of art in gold, silver, and other metals; solid silver and electro-silver plate for domestic use; decorative table plate relieved with electro-gold and oxidized silver; antique art treasures in metal from the South Kensington Museum; Cloisonné and Champlevé enamels on silver and copper; bronze statuary. 217
- 131 Collinson & Lock,** London.—Furniture, wall papers, and textile fabrics in the old English style. 217
- 132 Storer, Joseph,** Stamford Brook, Hammersmith.—Table fountains. 218
- 133 Bailey, W., & J. A., Alloa,** Scotland.—Engraved table glass. 218
- 134 MacIntosh, James,** London.—Decorative doors and panels; imitations of woods and marbles, decorative designs and paperhanging. 219
- 135 Lafargue, Paul,** London.—Engravings on metals and marbles, plaques for cabinet and artistic furniture, interior decoration, etc. 219
- 136 Kerr, Edward,** Dublin.
a Process of decorating glass for household and ecclesiastical purposes. 219
b Stable lamps. 223
- 137 Zobel, Charles Ferdinand Julius,** London.—Hammer work in metal; bouquet of flowers hammered, in copper and zinc; architectural models and aloe plant hammered in zinc; conjuring apparatus in metal. 219
- 138 Engert, A. C., & Co., London.**—Ornamental mouldings for picture frames and architectural decorations. 220
- 139 Hieronimus, W., London.**—Frame mouldings, window cornices, decorating mouldings, etc. 220
- 140 Heaps & Wheatley,** Brotherton, Yorkshire.—Oil cooking stove, gas stove, water boilers, etc. 222
- 141 Gardner, John, & Sons,** London.—Lamps, Arctic expedition lamps, traveling canteens. 222
- 142 Clough, Samuel Wesley,** Staningley, near Leeds.—Yorkshire grates, with ovens for baking or roasting; kitchen grate, room grate specially adapted for railway companies' offices, waiting rooms, etc. 222
- 143 Gregory, James,** Lincoln.—Cooking apparatus, lime trough, plunger, mortar temperer, fire escapes, screw hoist, and continuous screw. 222
- 144 Steel & Garland,** Wharnccliffe Works, Sheffield.—Steel grates, with porcelain tiles; fenders, encaustic tile hearths, stoves with china tiles, fire irons, etc. 222
- 145 Smart, Walter,** Buckhurst Hill, Essex.—Sub-fire oven. 222

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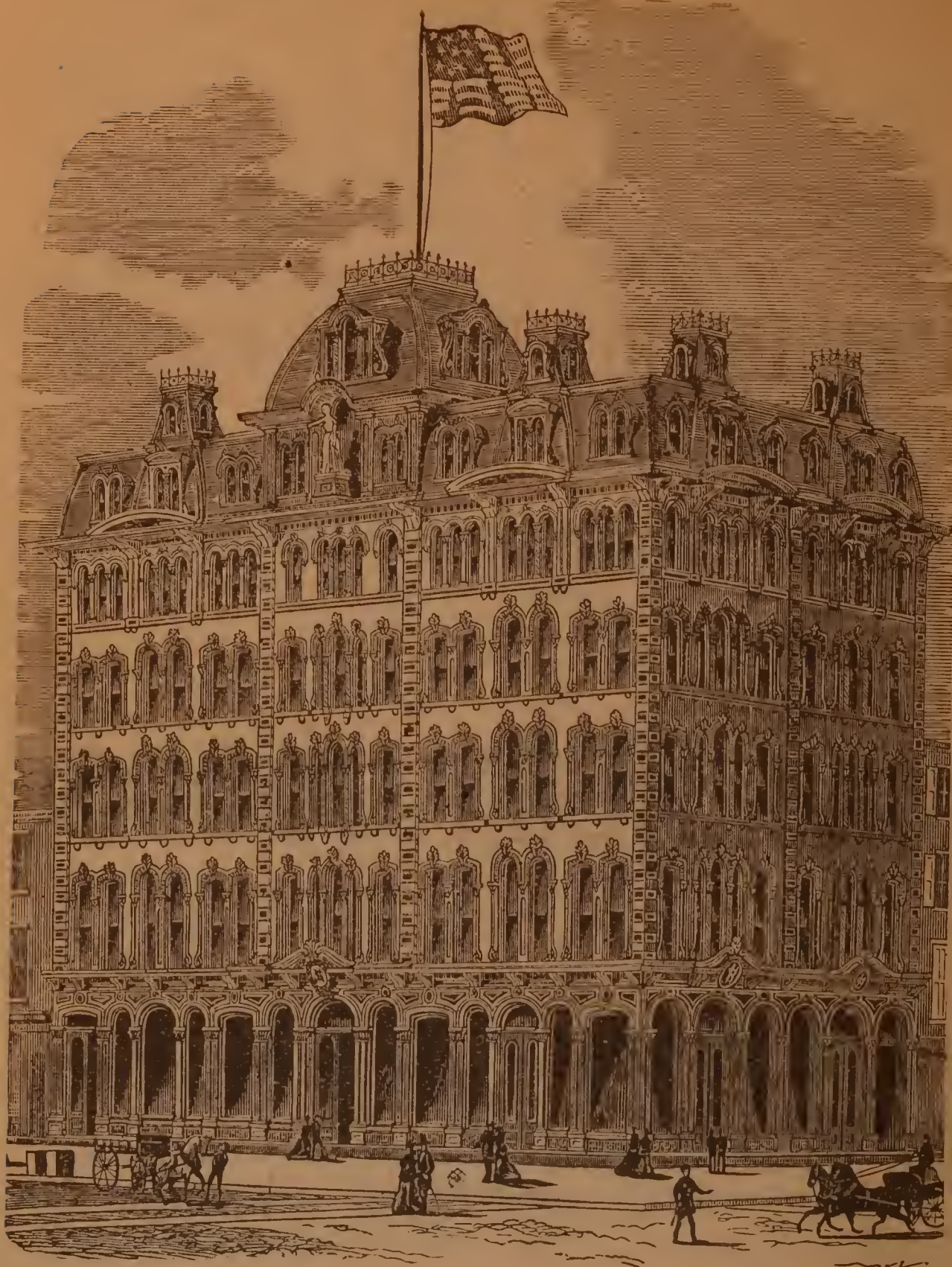
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Heating and Lighting Apparatus, Woven Wire, Woolen, Cotton, Linen.

- 146 Feetham, Mark, & Co., London.—Stoves and grates with appliances; decorated china for fireplaces. 222
- 147 Perkins, A. M., & Son, London.—Steam oven for marine use. (*In Machinery Hall.*) 222
- 148 Thornton, Ebenezer, Bradford, Yorkshire.—Cooking stove for gas or solid fuel. 222
- 149 Kimpton, Thomas, London.—Water waste preventer, gas regulator, pneumatic sound communicator. 223
- 150 Field, J. C., & J., London.—Night lights and candle guard. 223
- 151 Partridge & Co., Birmingham.—Brass gaseliers, brackets, etc. 223
- 152 Skelton & Co., London.—Street lamp, with reflectors. 223
- 153 Busse, G., & Co., London.—Water filters and cement. 224
- 154 Pullinger, Colin, Selsey, near Chichester, Sussex.—Sifter, cask stand, tapping mallet, sulphur blower, mouse traps, eel spear, mortising chisels, planes, bradawl, and brace. 224
- 155 Jennings, George, London.—Lavatories, baths, closets, urinals, and latrines; water meters and water waste preventors. 227
- 156 Bullivant, Thomas, London.—Sash window. 227
- 157 Edwards, G., London.—Sliding window sashes and frame. 227
- Yarns and Woven Goods of Vegetable or Mineral Materials.**
- 158 Brown, J. B., & Co., London.—Galvanized wire netting for inclosing poultry, pheasants, and dogs, etc. 228
- 159 Greening, N., & Sons, Warrington.—Woven wire. 228
- 160 Cox Brothers, Camperdown Linen Works, Dundee, Scotland.—Jute yarns, twines, etc. 229
- 161 Sandeman, Frank Stewart, Manhattan Works, Dundee, Scotland.—Linen and jute yarns, carpet yarns, burlaps, baggings, canvas paddings, scrim cloth, horse covers, and lap robes. 229
- 162 Laird, William, & Co., Canmore Linen Works, Forfar, Scotland.—Textile fabrics, dices, washed damasks, fancy towelings, horsecloths, sheetings, osnaburgs, stair covering, seamless bags, Hessians, striped beddings, paddings, ducks, buckram, etc. 229
- 163 Johnson, Jabez, & Fildes, Manchester.—Quilts and bedcovers, toilet or bureau covers, brocades, damasks, dimities, muslins, and printed cretons, towels, dress fabrics, etc. 230
- 164 Dewhurst, John, & Sons, Belle Vue Mills, Skipton, Yorkshire.—Sewing cotton finished and in various stages of manufacture. 230
- 165 Brook, Jonas, & Bros., Meltham Mills, Huddersfield.—Spool cotton, white and colored; crochet and embroidery cotton. 230
- 166 Neilson, Storer, & Sons, Thorn Mills, Johnstone, near Paisley.—Yarns; knitting, mending, and other cottons; yarns for lace, curtain, and fancy dress manufacturers. 230
- 167 Ferguson Brothers, Holme Head Works, near Carlisle.—Sateens. 230
- 168 Clark, John, jr., & Co., Glasgow, Scotland.—Spool cotton. 230
- 169 Swainson, Birley, & Co., Fishwick Mills, Preston.—Bleached cotton fabrics. 230
- 170 Barlow & Jones (limited), Manchester.—Toilet quilts, covers, and mats; cloakings, cotton towels, blankets, alhambras, and counterpanes, plain and fancy muslins, etc. 230
- 171 Ashworth, Edmund, & Sons, Egerton Mills, Bolton, Lancashire.—Cotton in various stages of manufacture; yarns, sewing cottons; crochet, embroidery, knitting, mending, and glove cottons, linen finish thread. 230
- 172 Pearson, Thomas, & Son, Victoria Mills, Little Bolton.—Quilts, quiltings, toilet covers, and mats. 230
- 173 Hawkins, John, & Sons, Manchester.—Plain and twilled calicoes and prints. 230
- 174 Wild, John, Greenfield Mills, Shaw, near Oldham.—Cotton plush velvet-reen. 231
- 175 Schwabe, Salis, & Co., Manchester.—Cotton prints for garments, chintzes, and furniture. 232
- 176 Simpson & King, Manchester.—Printed cotton furniture fabrics. 232
- 177 Marshall & Co., Leeds.—Linen sewing threads. 233
- 178 McBride, Robert, & Co., Belfast.—Cotton and mixed cotton and linen goods. 233
- 179 Normand, James, & Sons, Dysart, Fifeshire, Scotland.—Linens for house-keeping, shoe linings, etc. 233
- 180 Ewart, William, & Sons, Belfast, Ireland.—Linen fabrics. 233
- 181 The York Street Flax Spinning Company (limited), Belfast.—Linen piece goods, drills, ducks, sheetings, shirtings, and frontings. 233
- 182 Matier, Henry, & Co., Belfast.—Bleached and printed linens; handkerchiefs, plain, hemstitched, printed, and embroidered. 233
- 183 Ainsworth, Thomas, Cleator Mills, Cleator, Cumberland.—Linen threads and towels. 233
- 184 The Greenmount Spinning Company, Greenmount Factory, Dublin.—Linen and cotton goods for domestic and clothing purposes. 233
- 185 Ullathorne & Co., London.—Shoe and saddlers' threads, heel balls, and shoe findings. 233
- 186 Fenton, Connor, & Co., Linen Hall, Belfast.—White linens, cambric, table linens, linen ducks, drills, etc.; printed shirtings and lawn dress goods. 233
- 187 Brown, John S., & Sons, Belfast.—Table linen, diapers, sheetings, shirting linen, lawns, linen and cambric handkerchiefs, and yarns. 233
- 188 Richardson, J. N., Sons, & Owden, Belfast.—Linen goods. 233
- 189 Dicksons, Furguson, & Co., Belfast.—Linens bleached and unbleached. 233

Woolen and Linen Goods, Felting, Carpets, Silks.

- 190 Dunbar, McMaster, & Co., Bleachers,** Gilford, County Down, Ireland.—Linen threads, gray and bleached yarns. 233
- 191 Thorpe, John, & Co. (limited),** Walkden, near Bolton.—Furniture upholstered with patent imitation leather. 234
- 192 Nairn, Michael, & Co., Kirkaldy,** Scotland.—Floor oil cloths. 234
- 193 Tull, Glanvill, & Co., Crown Works,** London.—Floor coverings. 234
- 194 Corticine Patent Floor Covering Company,** London.—Floor covering. 234
- 195 Hall, Thomas, Edinburgh.**—Hand painted cloths in imitation of tapestry, for wall decoration. 234
- 196 Wellock, J., & Co., Bradford,** Yorkshire.—Waterproof materials for cart and wagon covers. 234
- 197 Boulinton Floor Cloth Manufacturing Company (limited),** Manchester.—Floor cloth. 234
- 198 Andrews, Henry, & Co., Leeds.**—Worsted coatings, wool and union cloths, and wool meltons. 235
- 199 Hooper, Charles, & Co., Eastington Mills,** Stonehouse, Gloucestershire.—Woolens, broadcloths, military cloths, doeskins, beavers, elysians, kerseys, meltons, coatings, and trowserings. 235
- 200 Salter, Samuel, & Co., Home Mills,** Trowbridge, Wiltshire.—Trowserings and coatings. 235
- 201 Mahony, Martin, & Brothers, Blarney,** Ireland.—Tweeds, boating serge, worsted coatings, railway traveling wraps. 235
- 202 Anderson, David, & Son, Lagan Felt Works,** Belfast, Ireland.—Roofing, flooring, and ship sheathing felt, lining felt, hair felts for covering boilers and steam pipes. (*In Machinery Hall.*) 235
- 203 Bliss, William, & Son, Chipping Norton,** Oxon.—Tweeds, woolen serges, and shawls; mauds and rugs; saddlers' woolens. 235
- 204 Brigg, J. F., & Co., Huddersfield,** Yorkshire.—Beavers, coatings, cheviot, cassimeres, carriage and livery cloths, drills, ducks, doeskins, elysians, meltons, kerseys, pilots, rugs, vestings and quiltings, velvets, union cloths, witneys, and reversible coatings. 235
- 205 Carr, Isaac, & Co., Twerton Mills,** Bath.—Woolen cloths, meltons, twills, beavers. 235
- 206 Bubb & Co., Southfields Mills,** near Stroud.—Woolen cloths; billiards, government, and piano cloths. 235
- 207 Marling & Co., Ebley and Stanley Mills,** Stroud, Gloucestershire.—Raw, scoured, and dyed wool; woolen cloths, beavers, Venetians, doeskins, deerskins, cassimeres, etc. 235
- 208 King, William, Gilroyd and Albert Mills,** Morley, Leeds.—Union and melton cloths. 235
- 209 Birchall, J. D., & Co., Burley Mills,** Leeds.—Woolen and worsted goods. 235
- 210 Hepworth, B., & Sons, New Wakefield Mills,** Dewsbury, Yorkshire.—Rugs and railway knee wrappers. 235
- 211 Hargreave & Nusseys, Farnley Low Mills,** Leeds.—Coatings, overcoatings, kerseys, meltons, woolen cloths. 235
- 212 Engert & Rolfe, London.**—Felts for roofing, fibrous asphalt, etc. 235
- 213 Davies, Robert S., & Sons, Stonehouse Mills,** Gloucestershire.—Cloths, doeskins, Venetians, meltons, coatings, beavers, etc. 235
- 214 Little, T. W., & Co., Leeds.**—Mantle cloths, waterproof tweeds, twills, meltons, blue and black deerskins, and diagonals. 235
- 215 McTear & Co., Belfast, Ireland.**—Roofing, ship sheathing, and inodorous felt; model of roof. 235
- 216 Jones, Pryce, Newtown, North Wales.**—Welsh flannel, homespuns, shawls, tweeds, yarns, etc. 236
- 217 Buckley, Joseph, & Co., Moorcroft Mills,** Delph, near Manchester.—Shawls, raised fancies, Rob Roys, and shepherds. 236
- 218 Buckley, J. E., & G. F., Linfitts Mill,** Delph, near Manchester.—Queensland and beaver shawls. 237
- 219 Williams, E. G., & Co., Bradford,** Yorkshire.—Textile fabrics for dress goods. 238
- 220 Pim Brothers, & Co., Dublin.**—Irish poplins, silk terries, and brocates. 238
- 221 Henderson & Co., Durham.**—Durham axminster. 239
- 222 Lewis, John, Halifax, Yorkshire.**—Brussels and Wilton carpets. 239
- 223 Gregory & Co., London.**—Indian and Persian carpets. 239
- 224 Robinson, Vincent, & Co., London.**—Carpets and rugs. 239
- 225 Crossley, John, & Sons (limited),** Dean Clough Mills, Halifax, Yorkshire.—Carpets, rugs, sofa carpets, table covers, etc. 239
- 226 Tomkinson & Adam, Kidderminster.**—Axminster carpets. 239
- 227 Lapworth Bros., London.**—Carpets and rugs. 239
- 228 Templeton J., & J. S., Glasgow.**—Brussels and Wilton carpeting; silk and wool window curtains. 239
- 229 Templeton, James, & Co., Glasgow.**—Axminster carpets, breadth carpeting, hearth rugs. 239
- 230 Webb, Edward, & Sons, Worcester.**—Hair cloth for furniture covering, hair cloth paddings, curled hair, crinoline, hair cloth. 240

Silk and Silk Fabrics.

- 231 Clayton, Marsdens, Holden, & Co. (limited),** Wellington Mills, Halifax.—Silk waste, spun silk yarns, woven fabrics. 242
- 232 Sheldon & Fenton, London.**—Sewing silks, tailors' twist, machine silks, etc. 243
- 233 Rickards, Charles Ayscough, Bell Busk Mills,** near Leeds.—Sewing and machine silks, twists; embroidery, knitting, and crochet silks. 243
- 234 Milner, Wm., & Sons, Leek,** Staffordshire.—Sewing silks. 243

Silks, Clothing, Jewelry, Ornaments, Fancy Goods.

- 235 Ward, Anthony, & Co., Albion Silk Mills, Leek, Staffordshire.—Silk threads. 243
- 236 Adams & Co., London.—Knitting silks, filoselle. 243
- 237 Hilditch, G., & J. B., London.—Silk and silk fabrics; velvets. 245
- 238 Norris & Co., London.—Silk for furniture and upholstery purposes. 246
- 239 French & Co., St. Mary's Mills, Norwich.—Black crape. 247
- 240 Stevens, Thomas, Stevengraph Works, Coventry.—Jacquard loom at work; ribbons, neckties, sashes, badges, and emblematical regalia; navy hat ribbons, gold and silver lace, silk-centred sachets, cards, and valentines. 248
- 241 Jacoby, M., & Co., Nottingham.—Valenciennes and silk guipures; imitation Swiss curtains, lace curtains. 249
- 242 Stewart, Moir, & Muir, Glasgow.—Curtains for window and decorative purposes and for use in the British section. 249
- 243 Hodges, T.W., & Sons, Leicester.—Elastic webs, braids, and cords. 249
- 244 Heymann & Alexander, Nottingham.—Silk, wool, and cotton laces, nets, quillings, trimmings, etc. 249
- 245 Browett, Frederick, & Co., Coventry.—Cambric frillings, curtain borders, dress trimmings, woven name tapes, and mantles. 249
- 246 Simon, May, & Co., Nottingham.—Lace curtains, valances; nets; Shetland scarfs, shawls, elastic webs, etc. 249
- Clothing, Jewelry, and Ornaments, Traveling Equipments.**
- 247 Schreiber, Felix August, London.—Ladies' underclothing. 250
- 248 Turner, Archibald, & Co., Leicester.—Elastic fabrics, cords, and braids; surgical braids and bandages. 250
- 249 Morley, J., & R., London.—Hosiery and gloves. 250
- 250 McLintock, James, & Sons, Barnsley, Yorkshire.—Down quilts, skirts, pillows, jackets, and dressing gowns; dress improvers, slippers, etc. 250
- 251 Welch, Margetson, & Co., London.—Scarfs and ties, silk handkerchiefs, linen collars, shirtings, umbrellas, rugs, etc. 250
- 252 Sykes, Josephine, & Co., London.—Corsets and ladies' belts. 250
- 253 Hitchcock, Williams, & Co., London.—Costumes of mixed fabrics. 250
- 254 McGee, John G., & Co., Belfast, Ireland.—Ulster overcoats and Irish homespun goods; traveling wraps, shawls, and rugs. 250
- 255 Smyth & Co., Balbriggan, Ireland.—Balbriggan hosiery, lace hose, light stockings. 250
- 256 Roe, William Allen, Leicester.—Boots and shoes. 251
- 257 Lobb, John, London.—Gentlemen's and ladies' boots. 251
- 258 Dash, Osmond, Brighton.—Hats, caps, and umbrellas. 251
- 259 Baxter, Richard, Thirsk, Yorkshire.—Boots; wooden clump boots. 251
- 260 Lincoln, Bennett, & Co., London.—Hats. 251
- 261 Humbert, Hermann, London.—Hats and bonnets; hat and bonnet shapes. 251
- 262 Daggett, Christopher, Woodstock, Oxfordshire.—Gloves. 251
- 263 Debenham & Freebody, London.—Gloves. 251
- 264 Tress & Co., London.—Hats; pith and felt solar hats and helmets. 251
- 265 Smith, George John, London.—Irish lace made by the Industrial Poor. 252
- 266 Dunraven, the Countess of, Adare, County Limerick, Ireland.—Embroidery on lawn; robes, pocket handkerchiefs, insertion for dresses, pincushion cover, etc. 252
- 267 Goggin, Jeremiah, Dublin.—Jewelry; table ornaments, mirrors, timepieces, reading stands, walking canes, pipes, drinking cups, tankards, etc. 253
- 268 Bryan, Charles, West Cliff, Whitby.—Jet, rough and in ornaments of various descriptions. 253
- 269 Francati & Santamaria, London.—Jet ornaments, brooches, earrings, bracelets, necklaces, etc.; jet cameo mosaics, carved by Roman cameo cutters. 253
- 270 Jefferys, John, London.—Sleeve links, studs, solitaires, scarf rings, etc. 253
- 271 Neal, John, London.—Gold and silver jewelry, precious stones, table ware, cutlery, gold and silver watches, chronometers, and timekeepers. 253
- 272 Aitchison, James, Edinburgh.—Scottish jewelry in gold and silver; Highland ornaments and stones found in Scotland. 253
- 273 Gibson, William, Belfast.—Watches; gold, diamond, and Irish bog oak jewelry; walking sticks and table ornaments. 253
- 274 English, John, & Co., Feckenham, Worcestershire.—Needles; fishhooks; steel pins; hairpins; bodkins. 254
- 275 Johnson, J., & Co., Charterhouse Works, Sycamore street, London.—Shell boxes, toy furniture and ornaments, and fancy paper boxes. 254
- 276 Davis & Wilson, Birmingham.—Whip, walking stick, and umbrella mountings; African chiefs' canes; whips and general whip materials. 254
- 277 Millward, Henry, & Sons, Redditch.—Needles, sewing machine needles, fishhooks. 254
- 278 Turner, R., & Co., Old Factory, Redditch.—Needles, pins, fishhooks, etc., displayed in a glass case, forming model of the exhibition of 1851. 254
- 279 Swaine & Adeney, London.—Whips, whip lashes, thongs, and sockets; horns, canes, and walking sticks; sporting apparatus. 254
- 280 Smith, John Wright, Leicester.—Self-acting needles used in hosiery frames. 254
- 281 Van Volen, Garret, London.—Human hair; tools used in preparation and manufacture. 254

Needles, Pins, Traveling Equipments, Stationery, Weapons.

- 282 Evans, David, Studley, Redditch.**
—Needles for hand and machine sewing. 254
- 283 Fenton, James, Birmingham.**—
Pearl buttons. 254
- 284 Kirby, Beard, & Co., Birmingham.**
—Pins, needles, hairpins, fishhooks, etc. 254
- 285 Sangster & Co., London.**—Umbrellas, parasols, sunshades, whips, canes. 254
- 286 Smith, James, & Son, Astwood Bank, near Redditch.**—Needles, showing stages of manufacture; bodkins, hairpins, and fancy cases for holding needles. 254
- 287 Hayes, Crossley, & Co., London.**—
New shape sewing needles, machine needles, pins, bodkins, and specimens in various stages of preparation. 254
- 288 Cooke Brothers, Birmingham.**—
Safety pins, curtain hooks, and fancy nails. 254
- 289 Woodfield, William, & Sons, Easemore Works, Redditch.**—Needles, sewing machine needles, fishhooks, etc.; sail tools and fancy needle cases. 254
- 290 Martin, William Henry, London.**—
Umbrellas, walking sticks, whips. 254
- 291 Nicholson, Hamlet, Rochdale.**—
Cricket and playing balls. 254
- 292 Tayler, D. F., & Co., New Hall Works, Birmingham.**—Solid-headed toilet pins, hairpins, hooks and eyes, pearl buttons; iron, steel, brass and copper wire. 254
- 293 Heath, William, Neveux Works, Redditch.**—Sewing machine needles. 254
- 294 Turner, George, & Co., London.**—
Military and traveling equipments, hammock valise, bedstead and sofa, mosquito curtains, tent, camp oven and canteen, ambulances, appliances for picketing horses, screw anchor peg. 255
- 295 Hoe, Richard, & Sons, London.**—
Leather portmanteaus, hat cases, and bags. 255
- 296 Harrington, J., & Co., London.**—
Imitation leather hat linings, shoes and shoe linings, wall decorations, pocket-books, belts, dispatch boxes, dressing and jewel cases, glove and handkerchief boxes, etc. 255
- 297 Bussey, Geo. G., & Co., London.**—
Chili leather portmanteaus, trunks, traveling bags, and leather and waterproof goods used for shooting and traveling purposes; breechloading guns and their accessories; gyro pigeon. 255

Paper, Blank Books, and Stationery.

- 298 Webster, Henry, London.**—Portable inkstand, writing cases, etc. 258
- 299 Hincks, Wells, & Co., Buckingham**
Steel Pen Works, Birmingham.—Steel pens, penholders. 258
- 300 Stevens, Henry Charles, London.**
—Inkstands, gum mucilage, quills, sealing wax, parallel rulers. 258
- 301 Ortnier & Houle, London.**—Seal engraving, steel and copper plate heraldic engraving, and die sinking. 258
- 302 Ward, Marcus, & Co., London.**—
Writing papers and envelopes, illustrated books, chromo prints, maps and atlases, cards, valentines, photograph albums, scrap books, educational works, copy books, fancy leather work, diaries, calendars, etc. 258

- 303 Blackwood, John, & Co., London.**
—Sealing and bottle wax. 258
- 304 Lyons, William, Manchester.**—
Sealing wax, gum mucilage. 258
- 305 Waterston, George, & Son, Edinburgh.**—Sealing wax. 258
- 306 Ford Works Co., Ford, Durham.**—
Paper stock, manufactured from esparto grass; products from esparto, bamboo, megasse, phormium tenax, maize, and other fibres. 259
- 307 Dudgeon, Arthur, London.**—Writing papers. 259
- 308 Pirie, Alexander, & Sons, London.**
—Writing papers, cardboard, and enamelled papers. 259
- 309 Dudgeon, Arthur, London.**—Paper pulp, manufactured from peat. 259
- 310 Fletcher, Robert, & Son, Kersley Paper Works, Stoneclough.**—White and colored papers, fine tissues, silver tissues, copying and cigarette papers. 259
- 311 Birdsall & Son, Northampton.**—
Binding of the Hexaglot Bible. 261
- 312 Goodall, Charles, & Son, Camden Works, London.**—Playing and Christmas cards. 262
- 313 Rimmel, Eugene, London.**—Valentines and fancy crackers. 262
- 314 Jeffrey & Co., London.**—Artistic wallpaper decorations. 264

Military and Naval Armaments, Ordnance, Firearms, and Apparatus of Hunting and Fishing.

- 315 Reilly, E. M., & Co., London.**—
Breechloading guns and express rifles. 265
- 316 Greener, William Wellington, Birmingham.**—Sporting guns and rifles; breechloading guns. 265
- 317 Rigby, John, & Co., Dublin.**—Guns and rifles and their accessories. 265
- 318 Henry, Alexander, Edinburgh.**—
Breechloading express rifles, fowling-pieces, harpoon and bomb-lance guns; military arms and target rifles. 265
- 319 Clay, Randolph, London.**—A converter for breechloading firearms; flexible gas tubing; an instrument for tracing ellipses and other curves; portable invalid bed tray; model of a deck seat with life-raft and of a boat distinguishing hook. 265
- 320 Dougall, James Dalziel, Glasgow.**
—Long-range shotguns and rifles. 265
- 321 Copeland, George Alexander, Camborne, Cornwall.**—Safety blasting cartridges. 265
- 322 Lancaster, Charles, London.**—Guns, rifles, cannon; drawings and models of the oval bored. 265
- 323 Scott, W., & C., & Sons, Premier Gun Works, Birmingham.**—Sporting firearms, revolvers, gun materials. 265
- 324 Needham, J., & G. H., London.**—
Breechloading double guns. 265
- 325 Purdey, Jas., London.**—Guns, rifles, etc. 265
- 326 Lancaster, Alfred, London.**—
Sporting guns and rifles. 265
- 327 Soper, William, Reading.**—
Rifles. 265

Weapons, Medical and Surgical Appliances, Hardware, Cutlery.

- 328 Lang, J., & Sons, London.—Guns and rifles. 205
- 329 Webley, P., & Son, Birmingham.—Sporting breechloading guns, rifles, and revolvers. 265
- 330 Needham, John, Sheffield.—Cutlery; daggers, table and dessert knives and forks; fish eaters. 268
- 331 Brookes & Crookes, Atlantic Works, Sheffield.—Pen, pocket, sportsman's, bowie, and table knives; scissors, razors, and dressing case instruments. 268
- 332 Marrison, Robert D., Norwich, Norfolk.—Breechloading guns and apparatus for filling cartridges; registered flyer for shooting practice. 269
- 333 Buchanan, James, Glasgow.—Sea fishhooks. 269
- 334 Ryder, William Henry, Birmingham.—Fishing tackle; taps for drawing effervescent wines or aerated waters. 270
- 335 Green, E. C., Cheltenham.—Sporting guns, with their appurtenances; cleaning rods, with attachments; cartridge-loading implements, nipple keys, gun cases and bags. 269
- 336 Tolley, J., & W., Pioneer Works, Birmingham.—Sporting breechloading shot guns, implements, cartridge cases, lubricators, bullets, and primers for reloading cartridges. 269
- 337 Williams & Powell, Liverpool.—Breechloading guns. 269

Medicine, Surgery, and Prothesis.

- 338 Allen & Hanburys, London.—Cod-liver oil; gelatine impregnated with atropine and calabar bean, for application to the eye. 272
- 339 Gerrard, Alfred William, London.—Mustard plasters. 272
- 340 Evans, Sons, & Co., Liverpool, and Evans, Lescher, & Evans, London.—Vegetable, animal, and mineral drugs; pharmaceutical products and accessories. 272
- 341 Usher, Rufus, Bodicote, Oxon.—Medicinal rhubarb; extract of henbane and dried henbane leaves; photographs of henbane plants. 272
- 342 Mackay, John, Edinburgh.—Articles of diet for invalid and table use. 273
- 343 Mellin, Gustav, London.—A non-farinaceous food for infants and invalids. 273
- 344 Goodall, Backhouse, & Co., Leeds.—Food for infants and invalids. 273
- 345 Lynch & Co., London.—Druggists' sundries and surgical instruments; spinal apparatus, chest protectors, feeding bottles, spray producers, poison bottles, etc. 276
- 346 Hicks, James Joseph, London.—Meteorological and scientific instruments. 276
- 347 Mayer & Meltzer, London.—Surgical instruments and galvanic batteries; cutlery. 276
- 348 Lee, Robert James, London.—Steam draft inhaler and disinfectant. 276
- 349 Lang, Jonas, & Jules, London.—Gum elastic and india rubber surgical instruments, elastic stockings, medical glass bottles, glass tubes, etc. 276

- 350 Pulvermacher, Isaac Louis, London.—Electrical instruments for medical purposes. 276
- 351 Rein, Mrs. F. C., London.—Anatomical belts, elastic stockings, etc.; trusses, bandages, etc. 276
- 352 Rein, Frederick Charles, & Son, London.—Acoustic, surgical, and veterinary instruments; magneto-electric machines; speaking tubes and trumpets; acoustical contrivances for churches and public buildings, etc.; anti-acoustic protector. 276
- 353 Liverpool Spun Oakum Company, Liverpool.—Oakum, stygium; pure antiseptic dressing for hospital use. 276
- 354 Patrick, Hugh William, & Son.—Porcelain enameled artificial palates; porcelain dentures. 277

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 355 Ward & Payne, Sheffield.—Tools for carpenters, joiners, coachmakers, shipwrights, millwrights, masons, bricklayers, tanners, curriers, engravers, diesinkers, plasterers; wood, stone, and metal carvers and turners, etc.; also sheep shears and steel. 280
- 356 Hawksworth, Ellison, & Co., Carlisle Works, Sheffield.—Steel, and articles made therefrom. 280
- 357 Baker, William, London.—Awls, bodkins, needles for saddlers, packers, and upholsterers; screwdrivers. 280
- 358 Addis, J. B., & Sons, Arctic Works, Sheffield.—Tools for carving stone and wood; turning tools for iron, brass, ivory, hard wood, etc.; carpenters' tools. 280
- 359 Kingsbury, Thomas, London.—Razors, knives, scissors, and dressing-case instruments, with specimens of manufacture. 281
- 360 Neal, John, & Co., London.—Table, dessert, and fish cutlery. 281
- 361 The Patent Nut and Bolt Company (limited), London Works, near Birmingham.—Iron bolts, nuts, screws, rivets, and washers; fish and sole plates; fish bolts, spikes, and fang bolts. 284
- 362 Francis, Thomas, & Co., Birmingham.—Nails. 284
- 363 Baker, Christopher, & Sons, Birmingham.—Coffin furniture; cabinet and general brass fittings; rails, stair rods, nails, and bolts. 284
- 364 The Phosphor Bronze Company (limited), London.—Phosphor bronze tools, locks, tubes, wire, sheet, steam fittings, parts of machinery, etc. 284
- 365 Adams, Robert, London.—Hinges and shoes, secure fastening bolts, weather tight sill bars for French casements, etc. 284
- 366 White, William George, London.—Steel safe and locking apparatus; bolts. 284
- 367 Zimdars, C. E., London.—Pneumatic signal and communication apparatus; pneumatic railway signals, indicating and registering apparatus, and self-flushing water-closet. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 368 Low, Son, & Haydon, London.—Brushes. 286

Brushes, Vehicles, Harness, etc.

- 369 Kent, George Barton, & Co., London.—Brushes, ivory paper knives, photographic stands, and shoe lifts; ivory brushes and mirrors. 286
- 370 Culmer, W., & Sons, London.—Brushes used in decorative art. 286
- 371 Bevis, Henry, London.—Silk banner with emblematic designs. 288
- 372 Elrick, Charles Gray, Aberdeen, Scotland.—Dressing combs; real and imitation shell, side braid, and high Spanish combs, etc. 289

Carriages, Vehicles, and Accessories.

- 373 Windover, Charles Sandford, London.—Brougham, canoc, landau, Victoria, Parisian, and Stanhope phaeton. 292
- 374 Mulliner, H., & Co., Northampton.—Carriages. 292
- 375 McNaught & Smith, Worcester.—Barouche, landau, and broughams. 292
- 376 Thorn, Charles, Norwich.—Carriages; shooting and baggage cart. 292
- 377 Roberts, John, Manchester.—Parisian phaeton. 292
- 378 Hooper & Co., London.—Carriages and drawings. 292
- 379 Roberts, John, & Sons, West of England Carriage Works, Bridgewater, Somerset.—Carriages. 292

- 380 Peters, Thomas, & Sons, London.—Carriages. 292
- 381 Thompson, Charles, London.—Perambulator. 293
- 382 Hawkins Brothers, Hatherton Works, Walsall.—Bits, stirrups, spurs, chains, buckles, and general saddlery iron work. 296
- 383 Hudson, Samuel, Dublin.—Trace and shaft tug safety buckles; safety stirrup. 296
- 384 Martin, Robert, Old Charlton, Kent.—Horse clipping machines; circular cutters for cutting the teeth of the above machines. (*In Machinery Hall.*) 296
- 385 Pollock, Sydney, London.—Apparatus for checking runaway and unmanageable horses. 296
- 386 Fetherston, John J., Dublin.—Historic portraits, miniatures, and enamels, unique and original, reproduced in personal ornaments from antique designs; armors, costumes. 257
- 387 Goodall, Chas., & Son, London.—Card printing. 424
- 388 Cohné, Sigismund, London.—Bearings requiring no lubricant. 573
- 389 Parkinson Brothers, Burnley.—Spiced pickling vinegar. 660
- 390 Universal Charcoal and Sewage Company (limited), Manchester.—Charcoals and charcoal manure, illustrating the utilization of town's refuse. 681

NEW SOUTH WALES.

(North of Nave, Columns 10 to 17.)

Chemicals, Ceramics, Furniture, Woven Goods.

Chemical Manufactures.

- 1 Read, R. B., Randwick.—Extract, leaves, and berries of *Smilaxis glycyphylla*, or Australian sarsaparilla. 200
- 2 Barrett & Co., Sydney.—Aerated waters and cordials. 200
- 3 Gilroy & Hurst, Sydney.—Baking, custard, egg, and butter powders. 200
- 4 Hunt, A. M., & Co., Goulburn.—Baking powders. 200
- 5 Swain & Co., Parramatta.—Washing fluid and soap. 201
- 6 New South Wales Shale and Oil Company, Sydney.—Kerosene oil, etc. 201
- 7 New South Wales Commissioners, Sydney.—Stearine candles. 201
- 8 Layton, Fred., Grafton, Clarence River.—Soap and candles. 201
- 9 Underwood, Thomas, Paddington.—Paints and paint pigment. 202
- 10 Hoff, M. Camille, Nakutakinna, New Caledonia.—Indigo. 202

Ceramics, Pottery, Porcelain, Glass, etc.

- 11 New South Wales Commissioners.—Churns, jars, etc. 210

Furniture, etc.

- 12 Lyons, Cottier, & Co., Sydney.—Stained glass staircase window, subject, "Captain Cook." 219
- 13 Hudson Brothers, Steam Joinery Mills, Sydney.—Window sashes, outside hall door, inside four-panel door, drapery panel door, French casements, cedar table legs. 227

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 14 Read, John Cecil, Darlinghurst, Sydney.—Mats and matting made of cocoa fibre yarn, by aborigines of New South Wales and Frazer's Island. 229

Clothing, Animal and Vegetable Products, Vehicles, etc.

- 15 Rudder, E. W., Kempsey.—Linen. 233

Woven and Felted Goods of Wool, etc.

- 16 Rudder, E. W., Kempsey.—Woolens. 235
 17 New South Wales Commissioners.
a Tweeds. 235
b Shawls. 237
 18 Jennings, P. A., Sydney.—Rug of tanned platypus skin. 239
 19 Layton, Fred., Grafton.—Wallaby skin rug. 239

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 20 Jennings, P. A., Sydney.—Collaret and cuffs of platypus skin. 250
 21 Midgley, Mrs., Cook's River.—Wool flowers, copied from Australian native flowers. 254
 22 Layton, Fred., Grafton.—Furs and skins of opossum, kangaroo, wallaby, and platypus. 256

Paper, Blank Books, and Stationery.

- 23 Government Printing Office, Sydney, New South Wales.—Blank books. 261

Medicine, Surgery, Prothesis.

- 24 Spencer, John, Sydney.—Mechanical dentistry. 277

Fabrics of Vegetable, Animal, or Mineral Materials.

- 25 New South Wales Commissioners, Sydney.—Brushware. 286
 26 New South Wales Commissioners, Sydney.—Manilla rope, New Zealand flax rope, and lines. 287
 27 Green, R., Sydney.—Cradles, flower stand, chair, perambulator; cane and willow work. 289

Carriages, Vehicles, and Accessories.

- 28 Robertson, John.—Concord buggy with canoe front; woodwork and ironwork entirely of New South Wales material. 294
 29 New South Wales Commissioners.—Lady's side saddle. 296
 30 New South Wales Commissioners, Sydney.—Saddlery. 296

Arboriculture and Forest Products.

- 31 Macarthur, Sir W., assisted by Hill and Hanrahan and J. Hassell.—Woods of southern districts. 600
 32 Moore, Charles.—Woods indigenous to the northern districts. 600
 33 Shoobert, James, Sydney.—Iron bark and turpentine timber. 600
 34 Derepas, W., Yonngara Station.—Boree, and straight and curly yarran timber. 600
 35 Hodgson, George, Redfern.—Timber from Bellinger River. 600
 36 Penzer, J., Bundainar, near Dubbo.—Timber. 600

- 37 Du Faur, E., Sydney.—Timber from Mount Victoria. 600

- 38 Hudson Bros, Botany Road, Redfern.—Timber. 600

- 39 Derepas, R., Yonngara.
a Yarran gum. 603
b Quongong nuts. 605

- 40 Harling, Mrs., and H. H. Field, Sydney.—Pressed ferns. 604

- 41 Moore, Charles, Botanic Gardens, Sydney.—Seeds, ginger-root, and bitter bark. 605

- 42 Hemmings, F. W., Loma Loma, Fiji.—Dried cocoanut. 605

- 43 Ryder Bros, Mango Island, Fiji.—Dried cocoanut. 605

Agricultural Products.

- 44 Lovegrove, W., Terrara, Shoalhaven River.—Maize. 620

- 45 Ryder Bros, Mango Island, Fiji.
a Maize. 620
b Beans. 621
c Turmeric and turmeric powder. 622

- 46 Peden, M. J., Bega.—Maize. 620

- 47 Demestre, E., Shoalhaven.—Maize. 620

- 48 Eggins, James, Grafton, Clarence River.—Maize. 620

- 49 Blain, C. R., Grafton, Clarence River.—Maize. 620

- 50 Macarthur, Sir W.—Maize. 620

- 51 Lewis Bros., Tamworth.—Wheat. 620

- 52 Dalton Bros., Orange.—Wheat. 620

- 52 Nelson Bros., Orange.—Wheat. 620

- 54 Jaeschke, Gustave, Clarence River.—Cigars and tobacco leaf. 623

- 55 Schweigert, W., & Co.—Cigars. 623

- 56 Muirhead, R., Grafton, Clarence River.—Cigars. 623

- 57 Hoff, M. Camille, Nakutakina, New Caledonia.—Coffee. 623

Land Animals.

- 58 Government Printing Office, Sydney.

- a* Mammals of Australia and New South Wales. 631

- b* Snakes of Australia. 637

- 59 Jennings, P. A., Sydney.—Stuffed platypus. 637

Water Animals, Fish Culture, and Apparatus.

- 60 Hemmings, F., & W., Loma Loma, Fiji.—Bêche de mer. 643

Animal and Vegetable Products.

- 61 Secombe, R., Milton, Ulladulla.—Preserved milk. 651

- 62 Wright, Davenport, & Co., Sydney.—Leather. 652

- 63 Forsyth, J., & Sons, Sydney.—Leather. 652

- 64 Alderson & Sons, Sydney.—Leather. 652

- 65 Bell, H., Sydney.—Tallow and neat's-foot oil. 652

Animal and Vegetable Products, Textile Substances, Fertilizers, etc.

- 66 Hewitt, T. G., Grafton, Clarence River.—Tallow and neat's-foot oil. 652
- 67 Berry, J. S., Botany, Sydney.—Neat's-foot oil and glue. 652
- 68 Layton, Fred., Grafton, Clarence River.—Beeswax. 654
- 69 Sydney Meat Preserving Co., Sydney.—Preserved meats. 656
- 70 Squires, Elam, Penrith.—Preserved fruits, jams, and jellies. 656
- 71 Hoff, Camille, Nakutakina, New Caledonia.—Preserved pineapples. 656
- 72 Biddell Bros, Sydney.—Preserved lemons and oranges. 656
- 73 Moore, Charles, Botanic Gardens, Sydney.—Preserved lemons and oranges. 656
- 74 Watson Bros., Young.—Flour. 657
- 75 Lewis Bros., Tamworth.—Flour. 657
- 76 Cohen & Levy, Tamworth.—Flour. 657
- 77 Dalton Bros., Orange.—Flour. 657
- 78 Nelson Bros, Orange.—Flour. 657
- 79 Waters, James, Ravensdale, Brisbane Water.—Arrowroot. 658
- 80 Cole, W., & Son, Tomago, Hunter River.—Arrowroot. 658
- 81 Laurie, W., & L., Gloucester, Port Stephens.—Arrowroot. 658
- 82 Ryder Bros., Mango Island, Fiji.—Arrowroot. 658
- 83 Payne, George, Grafton, Clarence River.—Arrowroot. 658
- 84 Champion, George, Ulmarra, Clarence River.—Arrowroot. 658
- 85 Munn, A. L., Merimbula.—Maizena. 658
- 86 Colonial Sugar Refining Co.—Refined sugars. 659
- 87 Martin, George, Grafton, Clarence River.—Sugar. 659
- 88 Chowne, E. G., Ulmarra, Clarence River.—Sugars. 659
- 89 Biddell Bros., Sydney.—Confectionery. 659
- 90 New South Wales Co., Clarence River.—Raw sugars. 659
- 91 Fallon, James T., Albury.—Wines. 660
- 92 Munro, A., Bebeah, Singleton.—Wines. 660
- 93 Carmichael, G. L., & J. B., Porphyry, Williams River.—Wines. 660
- 94 Brecht, Carl J. P., Rosemount, Denman.—Wines. 660

- 95 Powell, Edward, Richmond.—Wines. 660
- 96 Parnell, Montague, West Maitland, Hunter River.—Wines. 660
- 97 Wyndham, Wadham, Bukkulla, Inverell.—Wines. 660
- 98 Wyndham, George, Branxton, Hunter River.—Wines. 660
- 99 Monk, D. J., Sydney.—Malt and wine vinegars. 660
- 100 Marshall, J., Paddington Brewery.—Ale and porter. 660
- 101 Hardie, John, Sydney.—Biscuits. 661
- 102 Layton, Fred., Grafton, Clarence River.—Castor oil. 662

Textile Substances of Vegetable or Animal Origin.

- 103 Hemmings, F., & W., Loma Loma, Fiji.—Cotton. 665
- 104 Ryder Bros., Mango Island, Fiji.—Cotton. 665
- 105 Hoff, Camille, Nakutakina, New Caledonia.—Cotton. 665
- 106 Moore, Charles, Botanic Gardens, Sydney.—Vegetable fibres of various kinds. 666
- 107 Rudder, E. W., Kempsey.—Fibre of gigantic nettle tree. 666
- 108 Ramsay, D., Sydney.—Wools. 667
- 109 Lowe, A. H., Dynevor.—Wool. 667
- 110 May, J. M., Randwick, near Sydney.—Silk materials from the grain to the manufacture, produced by the inmates of the Asylum for Destitute Children, Randwick. 668
- 111 Thorne, George, Sydney.—Cocoons and cards of eggs desiccated and pierced, grown at Claremont, Rose Bay, Sydney. 668

Agricultural Engineering and Administration.

- 112 Bell, H., Sydney.—Bonedust. 681
- 113 Berry, J. S., Botany.—Bonedust. 681

Ornamental Trees, Shrubs, and Flowers.

- 114 Government Printing Office, Sydney.—Orchids of Australia. 712

THE SUN NEWSPAPER

Is printed and published every day in the year, at 166, 168, and 170 Nassau Street, New York City. Its regular edition on secular days now (April, 1876) averages about 140,000; its weekly edition over 88,000; and its Sunday issue is nearly 100,000. It thus prints and sells more than a million copies a week, which are read all over the United States. This is a circulation unprecedented in American journalism, and it is constantly on the increase. In proof of this, let the following figures testify. They show the number of copies of THE SUN printed every week during the year ending March 11, 1876.

WEEK ENDING	COPIES PRINTED.	WEEK ENDING	COPIES PRINTED.
March 20.....	849,382	September 18....	860,358
27.....	845,802	25.....	858,778
April 3.....	857,956	October 2.....	863,935
10.....	863,556	9.....	870,820
17.....	855,076	16.....	878,082
24.....	858,270	23.....	874,625
May 1.....	869,542	30.....	876,160
8.....	867,550	November 6.....	908,580
15.....	877,450	13.....	852,372
22.....	874,946	20.....	847,815
29.....	866,276	27.....	836,248
June 5.....	873,782	December 4.....	845,378
12.....	869,769	11.....	1,042,716
19.....	880,348	18.....	956,294
26.....	883,846	25.....	933,864
July 3.....	898,862	January 1.....	933,987
10.....	867,574	8.....	952,202
17.....	877,400	15.....	953,019
24.....	876,282	22.....	969,911
31.....	874,216	29.....	967,850
August 7.....	865,558	February 5.....	993,030
14.....	875,982	12.....	1,024,647
21.....	880,488	19.....	1,027,209
28.....	870,502	26.....	1,014,766
September 4.....	872,211	March 4.....	1,014,993
11.....	860,755	11.....	1,028,951
TOTAL.....		46,799,769	

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Chemicals, Ceramics, Glass, Furniture.

Chemical Manufactures.

- 1 Bosisto, Joseph, Richmond, Melbourne.—Chemical and pharmaceutical preparations obtained from the eucalyptus or gum trees of Australia, and other indigenous vegetation. 200
- 2 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Chemical and pharmaceutical preparations. 200
- 3 Hood & Co., Melbourne.—Chemical and pharmaceutical preparations. 200
- 4 Lewis & Whitty, Fitzroy.—Washing and baking powders, ball blue. 200
- 5 Stringer & Co., Melbourne.—Baking powder. 200
- 6 Sullivan, Joseph, Melbourne.—Poor man's filter; disinfectants, fluke specific and lick, hydrated silicate of aluminium. 200
- 7 Woodward, George, Kew.—Guano, deodorants, block of deodorized night-soil. 200
- 8 Fitts, Charles, & Son, Emerald Hill.—Neat's-foot and trotter oil. 201
- 9 Kitchen & Sons, Melbourne.—Stearine and large carriage candles. 201
- 10 Borthwick, Alex., Melbourne.—Varnishes, anti-fouling composition for ships' bottoms, enameled cast iron pedestal pillars, anti-corrosive paint. 202
- 11 Bowman, John S., Melbourne.—Colonial crayons. 202
- 12 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Crayons. 202
- 13 Lewis & Whitty, Melbourne.—Blackening. 202
- 14 Hogg, S. P., & Co., Melbourne.—Curry powder. 203
- 15 Lewis & Whitty, Fitzroy.—Hair oil, essences, curry powder. 203
- 16 Perry, Hunter, & Co., Sandhurst.—Safety fuse. 204

Ceramics, Pottery, Porcelain, Glass, etc.

- 17 Birmingham & Lacy, Brunswick.—Red building and white pressed and moulded bricks. 206
- 18 Nolan, Luke, Brunswick.—Stone-ware drain pipes. 206

- 19 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.
 - a Fire-clay crucibles. 207
 - b Encaustic tiles, trusses, vases, etc. 208
 - c Earthenware and pottery. 210
 - d Glassware. 216
- 20 Adams, R. T., Melbourne.—Filters. 210
- 21 Bendigo Pottery Co., Sandhurst.—Earthenware worm for still. 210
- 22 Nolan, Luke, Brunswick.—Bronze vases, stone porous jugs, patent damp-proof for floor ventilation. 210
- 23 Ferguson & Urie, Melbourne.—Stained glass for windows. 214
- 24 Gledhill, Melbourne.—Glass bottles. 215
- 25 Melbourne Glass Bottle Works Co., Emerald Hill.—Glass bottles. 215
- 26 Mount & Co., Emerald Hill.—Glass-ware. 215

Furniture, etc.

- 27 Alcock & Co., Melbourne.—Black-wood billiard table with appliances, console table. 217
- 28 Carr & Sons, Melbourne.—Window blinds, window sash, with Venetian shutters, etc. 217
- 29 Davis, J., Richmond.—Window sash. 217
- 30 Hodgson Bros., Sandhurst.—Self-acting Venetian blind, spring roller blind. 217
- 31 McEwan, James, Melbourne.—Side-board. 217
- 32 Muschialli, Lewis, Melbourne.—Pier glass, console table. 217
- 33 Baker, John, Emerald Hill.—Safety steps. 220
- 34 Wiegmann, August, Melbourne.—Basketware cradles, perambulators, chairs and flower stands, baskets. 221
- 35 Walker, A. R., Melbourne.—Gas cooking-stoves. 222
- 36 Shaw, Alfred, & Co., Melbourne.—Millet brooms and whisks. 224
- 37 Guthrie, G. D., Epsom, Sandhurst.—Collection of pottery ware for household use, etc. 224
- 38 Bogle, Andrew, & Co., Melbourne.—Boot and shoe brushing and cutters' polishing and sharpening machine. 224
- 39 Draper & Sons, Melbourne.—Earth-closets and fittings. 226

Woven Goods, Clothing, Paper, Weapons, Vehicles, Art.

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 40 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Flax, ropes, lines, twines, etc., manufactured by J. Miller & Co., James McNeilly, Sharp & Sons, and Crawford & Maine. 229
- 41 Donaghy, Michael, Geelong.—Ropes and lines. 229
- 42 Miller, James, & Co., Melbourne.—Ropes and lines. 229
- 43 McPherson, Thomas, Melbourne.—Corn sacks, wool packs, and sugar bagging. 229

Woven and Felted Goods of Wool, etc.

- 44 Barwon Woolen Mill Co., Geelong.
a Tweeds. 235
b Blankets. 237
- 45 Gray, Alexander, & Co., Albion Woolen Mills, Geelong.—Plain and fancy tweeds. 235
- 46 Ballarat Woolen Co., Ballarat.—Shawls, tweeds, blankets. 237
- 47 Director of Botanic Gardens, Melbourne.—Dyed woolen cloth and silk. 238
- 48 Robertson, John, Melbourne.—Dyed Angora goat's fleece. 240
- 49 Zoological and Acclimatization Society, Melbourne.—Angora goat's hair. 240

Silk and Silk Fabrics.

- 50 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Silk cocoons from the Acclimatization Society, Victoria, and Mrs. Bladen Neill; cultivated silk, in cocoons and hanks, also bleached, dyed, and worked upon Llama. 242
- 51 Timbrell, Ann, Collingwood.
a Cocoons produced by silkworms from Japan, France, Italy, and Greece. 242
b Silk (raw material in hank). 243
c Victorian silk, worked on Brussels net. 246
- 52 Victoria Ladies' Sericulture Co. (limited), Castlemaine.—Silk, desiccated and pierced cocoons. 242

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 53 Ford Brothers, Melbourne.
a Pith hats, in felt, silk, merino, etc. 251
b Pith sunshades for horses. 254
- 54 Inspector-General of Penal Department, Melbourne.—Boots and shoes. 251
- 55 Rosier, John, Melbourne.—Boots and shoes; studies from the feet of the statues in the statuary gallery, Melbourne public library. 251
- 56 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.
a Myall pipes; rouleau boxes of myall wood. 254
b Address-case of inlaid leather, made by J. W. Evans. 255
- 57 De Richelieu, Madam F., Windsor.—Ornaments made from fish scales, etc. 254
- 58 Pausacker, Evans, & Co., Melbourne.—Registered edge, solid leather portmanteaus. 255

Paper, Blank Books, Stationery.

- 59 Botanic Gardens, Director of, Melbourne.—Paper made from various barks, stems, and stems and leaves. 260
- 60 Ramsden, Samuel, Melbourne.—Various grades of paper, including cartridge, printing, and wrapping paper. 260

Weapons, etc.

- 61 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.
a Breechloading rifle. 265
b Aboriginal weapons, native axe. 268

Medicine, Surgery, Prothesis.

- 62 Stanway, W., South Yarra.—Models of chairs for invalids. 279

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 63 Danks, John, Melbourne.—Valves, cocks, lubricators, injectors, etc. 284
- 64 McIlwraith, John, Melbourne.—Gas pipe and tin tube 284

Carriages, Vehicles, and Accessories.

(For farm vehicles and railway carriages, see Departments of Agriculture and Machinery.)

- 65 Stevenson & Elliott, Melbourne.—Landau. 292
- 66 Bothwell, Wade, Melbourne.—Harness, saddles, whips, etc. 296
- 67 Glenister, W. A., Geelong.—Axles, Colling's crank, etc. 296
- 68 Stoneman, Alfred, Richmond.—Carriage springs. 296

Sculpture.

- 69 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Medals of the Victorian Intercolonial Exhibition, 1875; seals of the Melbourne Public Library, University, and Exhibition of 1862. 402

Painting.

- 70 Campbell, O. R., Windsor.—Crossing the Plains. 410
- 71 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Heraldic painting on panels. 410
- 72 Curtis, J. W., Melbourne.—Track off the Point Nepean road. 410
- 73 Guerard, E. Von, Melbourne.—Pulpit rock, Phillip Island, Ballarat in 1873. 410
- 74 Johnston, H. J., Melbourne.—Summer Sunset. 410
- 75 Whitehead, Isaac, Melbourne.—Dandenong State Forest. 410

Engraving and Lithographing.

- 76 Bowman, John S., Melbourne.
a "The Knob in the Alps," crayon, Miss Bowman.
b "In the Alps," crayon, Miss Adams.
c "Fall from the Omeo Plains," crayon.
d "Valley in North Gippsland," crayon.
e "A Pool in the Otway Ranges," crayon, F. Shaw
f "Bushy Park," crayon. 420

Photographs, Architectural Designs, Mining Tools, Forest Products.

- 77 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Lithographs of fossils, roots, and seeds. 423

Photography.

- 78 Ararat, Shire Council of, Ararat.—Photographic views and statistics of the shire. 430
- 79 Batchelder & Co., Melbourne.—Photographs of persons born in the colony of Victoria. 430
- 80 Bock, Henry, Gippsland.—Photographs of Victorian native flowers. 430
- 81 Chuck, T. F., Melbourne.—Photographs of persons born in the colony of Victoria. 430
- 82 Colac, Shire Council of, Colac.—Photographic views of the district. 430
- 83 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Photographic views of scenery, public and private buildings, cattle, etc. 430
- 84 Creswick, Borough Council of, Creswick.—Photographic views and statistics of the borough. 430
- 85 Darebin Shire, Council of, East Bourke.—Photographic views and statistics of the shire. 430
- 86 Echuca, Borough Council of, Echuca.—Photographic views and statistics. 430
- 87 Emerald Hill, Borough Council of, Emerald Hill.—Photographic views. 430
- 88 Hotham, Town Council of, Hotham.—Photographic views and statistics of the town. 430
- 89 Johnstone, O'Shannessy, & Co., Melbourne.—Photographs of persons born in the colony of Victoria, photographs colored in oil. 430
- 90 McDonald, D., St. Kilda.—Photographic views. 430
- 91 Noble, Timothy, Melbourne.—Photographs of theatrical celebrities. 430
- 92 Phoenix Foundry Co. (limited), Ballarat.—Photograph of locomotives, engine, and tender, manufactured for the Victorian government. 430
- 93 Prahran, Town Council of, Prahran.—Photographic views and statistics of the town. 430
- 94 Robertson Brothers, Colac.—Colored photographs of cattle, bred by exhibitors. 430
- 95 Sandhurst, City of, Sandhurst.—Photographic views and statistics of the city. 430
- 96 Stewart & Co., Melbourne.—Photographs of persons born in the colony of Victoria. 430
- 97 Surveyor-General of Victoria, Melbourne.—Photographic views of botanical and other gardens. 430
- 98 Wangaratta, Shire Council of, Wangaratta.—Photographic views and statistics of the shire. 430
- 99 Willett, G., Ballarat.—Colored photographs. 430
- 100 Wilson, Sir Samuel, Ercildoun.—Photographs: team of Hereford bullocks, bred by himself; prize sheep, his residence, etc. 430

- 101 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Biographical charts of the schools of Venice and the Venetian states; tools. 432

Industrial and Architectural Designs, etc.

- 102 Dowling, William, Emerald Hill.—Centre flowers, trusses. 442
- 103 Heathcote, T. S., Carlton.—Painted panels. 442
- 104 Murphy, Edward, Sandridge-road.—Centre flowers, and ventilators, ornamental chimney cap. 442
- 105 Patterson Brothers, Carlton.—Tables of imitation wood and marble. 442
- 106 Pepper, George, Windsor.—Plasterers' models, ceiling and wall ventilators. 442

Machines, Tools, etc., of Mining, Chemistry, etc.

- 107 Morrison, L. K., Melbourne.—Abyssinian tube-wells and pumps, with boring apparatus. 501
- 108 White, David, Stawell.—Safety hook, to prevent accidents from overwinding in mining claims. 503
- 109 O'Malley, Edmund, Melbourne.—Ventilating safety cage, for mines. 504
- 110 Harkness, A., & Co., Victoria Foundry, Sandhurst.—Disk, fitted on screwed stamper shank, and showing principle; cam or wiper. 505
- 111 Perry, Davis, & Co., Sandhurst.—Stamper gratings. 505

Railway Plant, Rolling Stock, etc.

- 112 Cornish & Co., Melbourne.—Seats for railway carriages. 571
- 113 Stoneman, Edward, Richmond.—Railway truck spring. 573

Aerial, Pneumatic, and Water Transportation.

- 114 Cornish & Co., Melbourne.—Life-preserving buoys, mattresses, belts, rafts, etc., seats, couches, and mattresses for ships. 590

Arboriculture and Forest Products.

- 115 Bass River Steam Saw Mills, Bass River.—Blue gum timber. 600
- 116 Director of Botanic Gardens, Melbourne.
a Carpological collection; barks, polished woods, fibre and tow prepared from barks, leaves, and stems. 600
b Resins, gums, oleo fat, and caoutchouc. 603
- 117 Lands and Agriculture, Department of, Melbourne.—Native woods. 600
- 118 Commissioners for Philadelphia Exhibition, Melbourne.
a Boxes, paper knives, and tubs, made of Victoria woods. 601
b Myall and grass-tree gum, rubber and rubber stamp. 603
- 119 Clark, John, & Sons, Melbourne.—Wattle bark. 602

Agricultural, Animal, Vegetable Products.

Agricultural Products.

- 120 Taylor, John, Allansford.—Adelaide wheat, grown at Merunga, near Warrnambool. 620
- 121 St. Arnaud Pastoral and Agricultural Society, St. Arnaud.—Short oats, wheat, barley. 620
- 122 Scott, James, Indigo, Chiltern.—Wheat. 620
- 123 Commissioners for Philadelphia Exhibition, Melbourne.—Purple-straw wheat, grass-tree plant. 620
- 124 O'Keefe, Andrew, Adelaide Vale, Clare Inn.—Purple-straw wheat. 620
- 125 Myring, Joseph, Campbell's Creek, Castlemaine.—Barley. 620
- 126 Adams, James, Warring.—White Tuscan wheat. 620
- 127 Laidlay, John, Bundoora, Plenty-road.—Wheat. 620
- 128 McNair, Angus, Bellerine East.—New fodder-pea. 620
- 129 Stewart & Ferguson, Indigo, Chiltern.—Wheat. 620
- 130 Connor, James, Allansford.—Fox-tail oats, grown at Merunga, near Warrnambool. 620
- 131 Schmitt, Lewis, Mornington.—Wheat. 620
- 132 Buckley, Edward, Newbridge, Loddon.—Red-straw wheat from counties of Gladstone and Bendigo. 620
- 133 Jack, John, Oxley Plains, Ovens District.—Frampton white wheat, grown on chocolate soil after English grass. 620
- 134 Northeastern Pastoral and Agricultural Society, Murchison.—Wheat grown by J. McNab, Tabilk. 620
- 135 Moncrieff, John, Tabilk, Goulburn River.—Purple-straw and white wheat. 620
- 136 Gilmour, Andrew, Colomsky, Buangor.—Oats from parish of Ballyrogan. 620
- 137 Rossi, Thomas, Dry Diggings, near Daylesford.—Purple-straw wheat. 620
- 138 Polson, Angus, Chapman, Moyston.—English barley, Tartarian oats, purple-straw and white wheat. 620
- 139 West Bourke Pastoral and Agricultural Society, Romsey.—White Tuscan wheat, grown by Hon. T. F. Hamilton. 620
- 140 Aboriginal Mission Station, Coranderk.—Hops. 623
- 141 McKenzie, James F., & Co., Melbourne.—Coffee, chicory, cocoa, and chocolate made from Trinidad nuts; mustard, spices. 623

Land Animals.

- 142 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.
a Water fowl, stuffed by Chas. French. 635
b Manna, with the insect producing it. 638
- 143 St. John, F., Melbourne.—Ducks, plover, grouse, quail, black swan, etc. 635
- 144 Grimwood, Thomas, Fern Tree Gully.—Quail, snipe, landrail. 635
- 145 Gaskell, Joseph, Melbourne.—Australian snipe. 635

- 146 Robertson, W. W., Richmond.—Australian native birds. 635
- 147 Gaskell, Joseph, Melbourne.—Wild animals. 637
- 148 Godfrey, F. R., Melbourne.—Wild animals. 637
- 149 McCoy, Prof., Melbourne University.—Wild animals, and black swan. 637
- 150 French, C., Melbourne.—Australian longicorns, buprestidal, lepidoptera, etc. 638
- 151 Timbrell, Ann, Collingwood.—Japan silkworms, modeled in wax. 638

Water Animals, Fish Culture and Apparatus.

- 152 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Brown trout. 641
- 153 St. John, F., Melbourne.—Fish. 641

Animal and Vegetable Products.

- 154 Bird, George, Inkerman, Lyndhurst.—Cheese. 651
- 155 Pierce, G. G., Melbourne.—Cheese. 651
- 156 Riddle, J., Lancefield.—Cheese. 651
- 157 Clark, John, & Sons, Melbourne.—Leathers, skins, basils. 652
- 158 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Rugs made from skins of Victorian animals. 652
- 159 Fink, M., Geelong.—Skins. 652
- 160 Quinn, H. S., Richmond.—Dyed and white wool mats, kangaroo glove leathers. 652
- 161 Brearley Brothers, Geelong.—Sole leather. 652
- 162 Dunckley & McBride, Melbourne.—Sash lines, whip gut, gut lathe bands, sausage casings. 652
- 163 Pearse Brothers, Fremantle, Western Australia.—Hides, leather, skins. 652
- 164 Fitts, Charles, & Sons, Emerald Hill.—Glue. 652
- 165 Penal Department, Inspector-General of, Melbourne.—Leather. 652
- 166 Wallis & Co., Richmond.—Leather, goat skin mat. 652
- 167 Boddy, Edward, Nagambie.—Flour. 657
- 168 Hood, F. & J., Melbourne.—Malt. 657
- 169 Martin, P. J., Melbourne.—Malt. 657
- 170 Myring, Joseph, Campbell's Creek, Castlemaine.—Malt. 657
- 171 Perrin, William, jr., Richmond.—Malt. 657
- 172 Bennett, T. K., Melbourne.—Preserved meats. 656
- 173 Director of Botanic Gardens, Melbourne.—Jam. 656
- 174 Zorn, Edward, Clayton's-road, near Oakleigh.—Tomato and Oakleigh sauces. 657
- 175 Wright, Payne, & Co., South Yarra.—Fruit jams. 657
- 176 Watson & Paterson, Melbourne.—Hams, bacon, mess pork. 657

Animal and Vegetable Products, Wines, Textile Substances.

- 177 Western Meat Preserving Co., Colac.—Preserved meats. 657
- 178 Melbourne Meat Preserving Co., Melbourne.—Preserved meats. 657
- 179 Lyon, George, Beechworth.—Tomato sauce. 657
- 180 Grant, Mrs., Richmond.—Tomato sauce. 657
- 181 Comport, Henry, Cheltenham.—Tomato sauce. 657
- 182 Stringer & Co., Melbourne.—Mixed pickles, sauces, curry powder. 657
- 183 McKenzie, Jas. F., & Co., Melbourne.—Oatmeal, groats, brose meal. 657
- 184 Trouette & Blampied, Great Western, Ararat District.—Wines. 660
- 185 Best, Joseph, Great Western, Ararat District.—Wine. 660
- 186 Docker, F. G. & J. B., Wangaratta, Beechworth District.—Wine. 660
- 187 Evans, Henry, Beechworth District.—Wine. 660
- 188 Mellon, Francis, Dunolly, Castlemaine District.—Wines. 660
- 189 Botten, William, Eddington, Castlemaine District.—Wine. 660
- 190 Jung, Otto, Castlemaine, Castlemaine District.—Wines. 660
- 191 Schroeder, Castlemaine, Castlemaine District.—Wines. 660
- 192 Crippa, Fabrizio, Hepburn, Castlemaine District.—Wine. 660
- 193 Greer & Co., Echuca, Echuca District.—Wines. 660
- 194 Vettler, John, Echuca, Echuca District.—Wines. 660
- 195 Weber, Jacob, Geelong, Geelong District.—Wine. 660
- 196 Deppeler, Jacob, Gheringhap, Geelong District.—Wine. 660
- 197 Ritchie, John, Murgheboluc, Geelong District.—Wine. 660
- 198 Bear & Ford, Tabilk Vineyard, near Seymour, Goulburn District.—Wine. 660
- 199 Egli, F., Tabilk, Goulburn District.—Wine. 660
- 200 Schmitt, Franz, Berwick, Melbourne District.—Wine. 660
- 201 Francis, Charles, Sunbury, Melbourne District.—Wines. 660
- 202 St. Hubert's Vineyard Co., Yering, Melbourne District.—Wines. 660
- 203 Johnston, J. S., Craiglie Vineyard, Sunbury, Melbourne District.—Wines. 660
- 204 Maplestone, Charles, Ivanhoe Lodge, Heidelberg, Melbourne District.—Wines. 660
- 205 Brasche, Charles, Sunbury, Melbourne District.—Wine. 660
- 206 Snowden, E. G., Boroondara, Melbourne District.—Wine. 660
- 207 Smith, G. S., Wahgunyah, Melbourne District.—Wine. 660
- 208 Pohl, Carl, Strathfieldsaye, Sandhurst District.—Wines. 660
- 209 Bruhn, Albert, Strathfieldsaye, Sandhurst District.—Wines. 660
- 210 Fuchs, Adolph, Strathfieldsaye, Sandhurst District.—Wines. 660
- 211 Fischer, August, Shamrock Vineyard, Emu Creek, Strathfieldsaye, Sandhurst District.—Wines. 660
- 212 Shaw, F. K., Goornong, Sandhurst District.—Wine. 660
- 213 Grosse, Frederick, Strathfieldsaye, Sandhurst District.—Wines. 660
- 214 Grosse, Fred., Toorongo Vineyard, Bendigo, Sandhurst District.—Wine. 660
- 215 Greiffenhagen, Wm., Strathfieldsaye, Sandhurst District.—Wines. 660
- 216 Brown, H. J., Australian Distillery, Melbourne.—Geneva spirits of wine. 660
- 217 Fuller, Alfred, Kew.—Ale, stout. 660
- 218 Henelly, James, Melbourne.—Ale. 660
- 219 Latham, Edward, Carleton Brewery, Carleton.—Ale, porter. 660
- 220 Martin, P. J., Melbourne.—Ale. 660
- 221 Reed, Henry, & Co., South Yarra.—Vinegar. 660
- 222 Steward, James, Eaglehawk, Sandhurst.—Ale. 660
- 223 Treacy, John, & Co., Geelong.—Ale, stout. 660
- 224 Warrenheip Distillery Co., Ballarat.—Whisky, Geneva spirits of wine. 660
- 225 Guest, T. B., & Co., Melbourne.—Fancy biscuits. 661
- 226 Smith & Son, West Melbourne.—Biscuits. 661
- 227 Swallow & Ariell, Sandridge.—Biscuits. 661
- Textile Substances of Vegetable or Animal Origin.**
- 228 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Cotton. 665
- 229 Atkinson, Wm., Camperdown.—Teazles. 666
- 230 Longmire, Thomas, Kooroocheang, Smeaton.—Flax stalks and seeds. 666
- 231 McPherson, Thomas, & Co., Melbourne.—Jute. 666
- 232 Armstrong, Alex., Warramtime, Shelford.—Wools. 667
- 233 Arnold, George, & Co., Melbourne.—Assorted wools grown by James Gibson, Cleveland, Tasmania; Wm. Gibson & Son, Scone, Tasmania; P. Russell, Langi Willi and Carngham, Victoria; Wm. Cumming, Mt. Fyans, Victoria; A. M. Campbell, Melaluka, Victoria; John Macvean, Mooloomoon, Victoria; Thos. Russell & Co., The Plains, Victoria; G. W. Thomson, Chalicum, Victoria; Thos. Millear, Green Vale, Victoria; Executors of late A. Russell, Mawallok, Victoria; Wm. Lewis, Stoneleigh, Victoria; J. & S. Austin, Mount Pleasant, Victoria; and Wm. Murray, Brie Brie, Victoria 667
- 234 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Wools; wool from S. Robertson, Geelong. 667
- 235 Currie, John Lang, Larra, Derimallum.—Wools. 667
- 236 Degraives, C. & J., Coliban Park, Elphinstone.—Wool. 667
- 237 Elder, W. & N. G., Elder, Rookwood.—Wools. 667

Textile Substances, Plants, Fruits.

- 238 Gilbert, Alfred N., Warwilla Station, Wanganilla, Deniliquin.—Wools. 667
- 239 Goldsbrough, R., & Co., Melbourne.—Assorted wools, grown by James Alexander, Woodhouse station; R. & J. Ramsey, Narrow Plains station; Carter Bros., Glenisla station; J. & H. Osborne, Momalong Plains; A. & H. McCulloch, and others. 667
- 240 Greeves, Edward G., Berriallcock, Skipton.—Wool. 667
- 241 Hastings, Cunningham, & Co., The Australian Wool Stores, Melbourne.—Fleeces of wool from the following breeders: H. Cattanach, Tellegara; C. W. Simson, Mundagal; Godfrey & Chambers, Pevensey; F. L. Parker, Quiamong; Everett & Watson, Tchelery and Nyang; Hon. Wm. Lang, M. L. A., Wargam; Hon. Phillip Russell, M. L. A., Carngham and Langi Willi; John L. Currie, Larra; Thomas Dowling & Sons, Jellalabad; executors of late A. Russell, Mawallock; Wm. Lewis, Stoneleigh; Ewan McPherson, Binduck; Godfrey McKinnon, Goonambill; Russell & Shaw, Eli Elwah; Rutherford Brothers, Ulupna; Hon. Robert Simson, M. L. A., Langi Kal Kal; Nichol & Telford, Tarrawonga; Knight & Lydiard, Koorongah; Mount Battery Co., Mount Battery; Alfred Chenery, Delatite; Alexander Wilson, Mount Emu; J. G. Reeves, Footscray. 667
- 242 Henty, Edward, Portland.—Wools. 667
- 243 Keynes, Joseph, Keyneton, South Australia.—Fleece and wool. 667
- 244 Lang, William, Wargam, Wanganilla, N. S. W.—Wools. 667
- 245 Moore & Co., Coorong, near Hay, N. S. W.—Wool. 667
- 246 McVean, John, Woolloomoonoo, N. S. W.—Wool. 667
- 247 Reeves, Isaac G., Footscray, Melbourne.—Wool. 667
- 248 Russell, Thomas, Barunah Plains, Mount Hesse.—Wool. 667
- 249 Rutledge, William, Farnham Park, Warrnambool.—Fleeces. 667
- 250 Rutherford, Andrew, Como, Kensington, Geelong.—Wool. 667
- 251 Synnot, Monckton, Melbourne.—Wool. 667
- 252 Synnot, George, & Co., Geelong.—Wool. 667
- 253 Thomas, C. T., North Sandridge.—Dressed skin of pure Romney ewe, bred by R. Muldoon, Boos. 667
- 254 Timms Brothers, Mount Hesse, Beeac.—Wools. 667
- 255 Watson, Alexander, Warribee.—Fleeces. 667
- 256 Wilson, Sir Samuel, Oakleigh Hall, East St. Kilda.—Wools and fleeces. 667
- 257 Wilson, John, Lismore.—Wool. 667
- 258 Howard, John, near Albury.—Sample cocoons of mulberry silk worms, with wound silk in its natural colors; floss silk; Japanese and Italian grain; hanks of suffocated and pierced cocoons. 668

Machines, Implements, and Processes of Manufacture.

- 259 Lennon, Hugh, North Melbourne.—Double-furrow plow. 670

- 260 Bodington, Robert, Carlton.—Sheep-support on rollers. 674

Ornamental Trees, Shrubs, and Flowers.

- 261 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Tree ferns from Dandenong State Forest and Mount Macedon; todea ferns from Mount Macedon. 707

- 262 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Fac-similes of specimens of fruit, the originals of which were selected during the past season, modeled and arranged by Thos. McMillan:

a Apples and pears from Josiah Trevestan, Ballarat; Chas. Draper, Hazelghen; H. U. Cole, Twyford; Robert Whatmough, Greensborough; Horticultural Society of Victoria; John Harbison, Essendon; John Smith & Sons, Riddell's Creek; T. C. Cole; King & Sons, Fyansford; Geelong and Western District Agricultural and Horticultural Society; W. L. Hunt, Malvern; Chas. Allen, jr., South Brighton; Thos. Christian, Mount Macedon; W. Lawford, Doncaster; J. Carson; J. Roberts; H. Boyce; Mr. Freike, Carisbrook; C. May, Sunbury; J. C. Cole, Richmond; J. D. Roberts, Hawthorne; Robt. Hepburn, Hawthorne; A. Stuart, Toorak; Geo. Kilroy, Caulfield; J. Weber, Geelong; Jas. Lang, Harcourt; Sir Redmond Barry; J. Banks, Flemington; Mr. James, Ballarat; Jos. Bosisto, Richmond; and Joseph Webster, Wahgunyah.

b Quinces from Sir Redmond Barry and J. Webber, Geelong.

c The medlar and the loquat.

d Peaches from C. Draper, R. Whatmough, W. Lawford, J. McDonald, G. & W. D. Agricultural and Horticultural Society.

e Nectarines from R. Whatmough and market.

f Apricots, plums, cherries, and olea europæa.

g Grapes, mulberries, figs, pomegranates, and oranges.

h Kau apples from Mr. Graham and the Melbourne Botanical Gardens.

i Gooseberries from Thos. Lang & Co. and F. Moss, Buninyong.

j Black, red, and white currants from Thos. Lang & Co.

k Raspberries from Henry Boyce.

l Almond, walnut, and hazel nuts.

m Strawberries.

n Tomatoes from Horticultural Society's Gardens; W. Chandler, Scoresby; and King & Son, Fyansford.

o Egg apple from H. J. Dines.

p Cape gooseberries and capsicums.

q Book collection of plants, shrubs, trees, and herbs. 709

- 263 Gaskell, Mrs., Melbourne.—Fac-similes of Victorian bush flowers. 709

SOUTH AUSTRALIA.—STATISTICAL PREFACE.

THE colony of South Australia embraces 25 degrees of latitude through the centre of the continent of Australia, from the Southern to the Indian Ocean, and is bounded on the east by the colonies of Victoria, New South Wales, and Queensland, and on the west by the colony of Western Australia. Its area is 914,730 square miles, or 585,427,200 acres; being about a third of the area of the United States of America, or ten times that of Great Britain. Its population is 210,699.

Its chief exports are wool, wheat, and copper. In 1875 the exports were valued at £4,442,100—namely: of wool, £1,778,297; of agricultural produce, £1,688,035; of metals, £758,664; and of other products, £217,104. Its revenue in 1875 was £1,143,312, its people not being taxed at a higher rate than 25 shillings a head. The people have purchased land of the government to the extent of 4,634,711 acres, of which 1,400,000 are under cultivation; and the average price paid since 1845 is £1 5s. 2d. per acre. The public debt is about £3,000,000; but, as an offset, is a sum of £2,225,000 due for lands sold to occupiers, and payable within six years.

The natural wealth of the colony in healthy climate, fruitful soils, and abundant minerals, has been greatly augmented by useful and substantial improvements. In addition to numerous ports made serviceable for coasting trade, inland traffic is facilitated by 884 miles of excellent macadamized roads, which have cost over £2,000,000; and by railways of nearly an equal further cost. The public and private buildings, both in towns and country, are mostly of well-built stone, with slate or iron roofs. Gardens and orchards, pasture and arable fields cover the more settled portions of the colony, whilst over hundreds of miles outside of these some 6,000,000 sheep, 200,000 head of horned cattle, many thousands of horses, and a few hundred camels, thrive at large on the native vegetation, save that their ranches, or runs, are mostly inclosed in areas of from 5 to 50 square miles with good post and wire fencing.

The best of meat and bread, fruit and vegetables, grow in abundance in South Australia. People there live well at little cost. Labor is well rewarded. There are not, or ought not to be, any able-bodied paupers in the colony. At the savings' banks, which are guaranteed by government, the small deposits of the poorer classes approximate £800,000, on which four to five per cent. interest is paid. Immigration is promoted by annual money votes, which, through Mr. F. S. Dutton, C. M. G., Agent-General for the colony in London, supplies free or assisted passages for eligible persons.

The government, the laws, and the social institutions, like the people of South Australia, have an Anglo-Saxon character. There is the fullest civil and religious freedom under a vice-regal governor, whose ministers are chosen by, and are responsible to, a majority of two houses of parliament elected by ballot, as to the larger house, of manhood suffrage alone, and, as to the smaller house, by a slightly restricted property qualification. These organizations have worked harmoniously to the contentment of the people.

Churches and schools are numerous. The facilities for acquiring real property in the colony are great, and laws well secure its quiet enjoyment. The public lands are mostly sold on credit: one-tenth per cent. is paid down as interest on the purchase money, which is not less than twenty shillings per acre. The balance is deferred to the sixth year, a second ten per cent. on the purchase money having been paid on the third year as interest. At the sixth year half the

balance may be renewed for four years at four per cent. if needed; but that the State may secure certain benefit from the sale of its lands under a credit system, the purchaser is bound to effect annual improvements. All metals, precious or other, go to the purchaser. The title to real estate from the crown is by registration, of which the purchaser gets a certificate in simple form. This system is popular, for it is ready and inexpensive at the outset, and is returnable to the registration office for record on it of all subsequent dealings, or for substituted certificate, or certificate as needed, in the court of sales. At the close of 1874 the value of landed property, which had passed under it, amounted to £9,260,186. Adjoining colonies have adopted this law.

The settled portions of the colony of South Australia are sectioned off into counties, and these counties, when arable cultivation requires it, are subdivided into hundreds, whose municipal governing bodies can be elected for local public works and education. Outside the hundreds, in the southern portion of the colony, the public lands are left for purely pastoral occupation, for which fourteen or twenty-one years' leases can be procured at moderate rents, regulated much by distance from ports of shipment, except that, both as to public lands inside or outside the hundreds, rights to search for and work minerals are readily granted. The rent of a mining lease is fixed at ten shillings an acre per annum, and fourteen years' term, renewable.

For the northern territory of South Australia, with its tropical climate, the land laws are modified. Land there is open for selection and sale at 7s. 6d. per acre, or for lease over ten years at 6d. per acre per annum. And, for the special growth of sugar, cotton, tea, rice, and tobacco, selections varying from 320 to 1280 acres can be made at a rental of 6d. per acre per annum for five years, when, if the land has been inclosed and one-half under cultivation, a free grant is procurable.

In 1872 South Australia erected 1973 miles of telegraph wire across her territory, and, at a cost of £350,000, connected Australia with India and Europe.

Commission from SOUTH AUSTRALIA (ADELAIDE) to the International
Exhibition:

HIS EXCELLENCY, SIR ANTHONY MUSGRAVE, C. M. G., Chairman.

HON. W. EVERARD, Commissioner of Crown Lands.	GEORGE MCEWEN, ESQ., J. P.
HON. H. E. BRIGHT, M. L. C., J. P., Commissioner of Public Works.	DR. SCHOMBURGH, D. P., J. P.
HON. JOHN CROZIER, M. L. C., J. P.	CALEB PEACOCK, ESQ., J. P.
HON. WENTWOOD CAVANAUGH, ESQ., M. P., J. P.	R. D. ROSS, ESQ., M. P., J. P.
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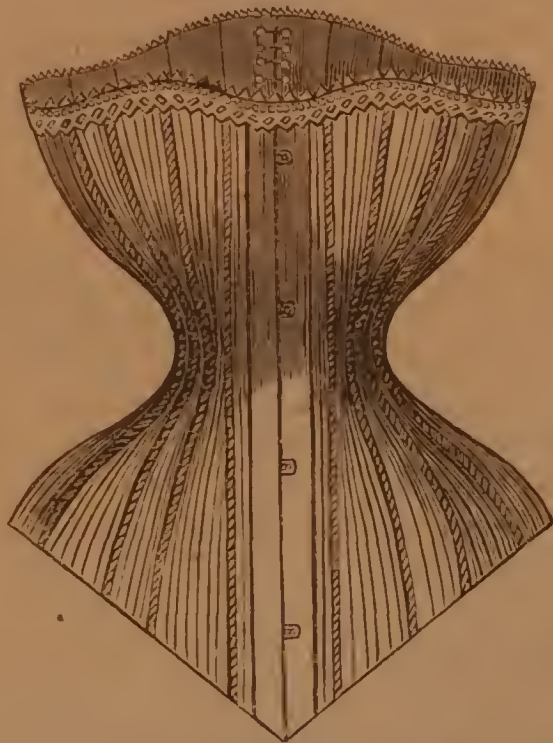
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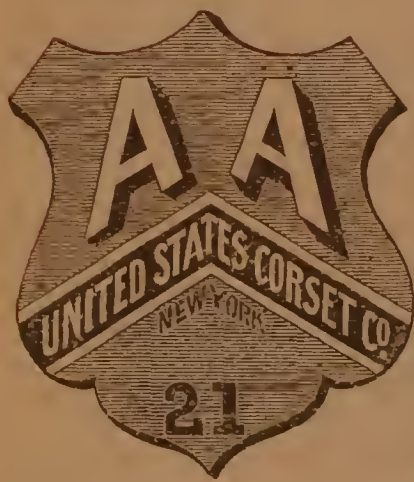
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- 7 Becker, I., Yam Creek.
- 8 Brese & Starke, Extended Union Mine.
- 9 Caledonia New Amalgamated Co.
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- 19 Sandy Creek Puddling Co.
- 20 Tripp, J. P., Lady Alice and Union Reef.
- 21 Union Prospectors Co.
- 22 Whitelaw, E. H., Pine Creek
- 23 Westcott, J. S., and Wisendunger, I., North Union Mine.
- 24 South Australian Commissioners, Adelaide.—Marble, sandstone, and slate from quarries in W. Adelaide. 102

Chemical Manufactures.

- 25 Barnard, George L., Adelaide.—Olive oil. 201
- 26 Davenport, Samuel, Adelaide.—Olive oil. 201

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 27 Knight, J. G., Adelaide.
 - a String made from human hair. 229
 - b Native bag used by Lubras (women). 230

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 28 Steiner, Henry, Adelaide.
 - a Shell necklace, gold brooch and earrings; shell brooch and earrings set in gold. 253
 - b Silver-mounted emu vases and ornaments; silver oxidized metal-figured piano candlesticks. 254
- 29 Davenport, Samuel, Adelaide.—Emu eggs made up in imitation of jewelry. 253
- 30 Nitscke, W., Adelaide.—Copper vase, cross, and pipe; silver cups made from a dollar and a five-franc piece; teapot made from a shilling. 254
- 31 Knight, J. G., Adelaide.—Aboriginal ornaments from the northern territory of South Australia. 254
- 32 Steiner, Henry, Adelaide.—Silver-mounted emu eggs inkstands. 254
- 33 Wendt, J. M., Adelaide.—Silver-mounted emu egg inkstand. 254
- 34 South Australian Commissioners, Adelaide.—Skins of indigenous birds and animals of South Australia made into muffs, collarettes, etc. 256

Military and Naval Armaments, Ordnance, Fire Arms, and Hunting Apparatus.

- 35 Knight, J. G., Adelaide.—Aboriginal weapons from the northern territory of South Australia. 269

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 36 South Australian Commissioners, Adelaide.—Iron castings made from West Adelaide ore. 283

Educational Systems, Methods, and Libraries.

- 37 South Australian Commission, Adelaide.—Herbarium, comprising specimens of all the known plants indigenous to South Australia, prepared by Dr. Schomburgk, director of the Botanic Gardens at Adelaide. 301

Maps, Mining Machines, Forest, Agricultural, Animal, Vegetable Products.

- 38 Adelaide Museum, Adelaide, F. G. Waterhouse, curator.—Collection of birds, mammals, reptiles, skins of animals, and eggs of South Australia. 301

Engineering, Architecture, Charts, Maps, and Graphic Representations.

- 39 South Australian Commissioners, Adelaide.—Statistical records and maps relating to South Australia, compiled by the Surveyor-General. 335

Photography.

- 40 Scott, G. B., South Australia.—Photograph of northern territory of South Australia. 430
- 41 South Australian Commission, Adelaide, South Australia.—Photographs descriptive of town, pastoral and farming life in South Australia, the Adelaide Botanic Gardens, suburban views and mining. 430

Machines, Tools, Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 42 Saunders, Robert, Manager of the Burra Burra Copper Mine, W. Adelaide.—Model of improved ore dresser. 505
- 43 Hancock, H. R., Moonta Copper Mines, West Adelaide.—Jigging machine. 505

Arboriculture and Forest Products.

- 44 Wilke, H., & Co., Port Adelaide.—Barks for tanning; ground and chopped mimosa (black wattle), and ground acacia. 600
- 45 Hardy, Arthur, Mt. Lofty, W. Adelaide.—Cork from tree raised from an acorn imported from Spain in 1864. 600
- 46 Davenport, Samuel, Adelaide.—Woods, useful and ornamental. 600
- 47 South Australian Commissioners, Adelaide.
- a* Woods, useful and ornamental, from the northern territory of South Australia, forwarded by J. B. Scott, government resident; woods from the neighborhood of Adelaide. 600
 - b* Fungi, supplied by W. B. Hughes, northern territory of South Australia. 604
 - c* Red berries (seeds of the creeping licorice), and corkserew pine seeds, from J. E. Kelsey and W. B. Hughes, northern territory of South Australia. 605
- 48 Knight, J. G., Adelaide.—Bark from the northern territory of South Australia. 602

Pomology.

- 49 South Australian Commissioners, Adelaide.—Wax models of fruit taken from originals grown in South Australia. 610

Agricultural Products.

- 50 Carling, Thomas, Adelaide.—Wheat. 620
- 51 Riggs, John, Adelaide.—Wheat. 620

- 52 Young, C. B., Adelaide.—Wheat. 620

- 53 South Australian Commissioners, Adelaide.

- a* Wheat, barley, oats, and rye. 620
- b* Peas. 621
- c* Linseed; hemp, rape, sunflower, prairie and rib grass seed. 624

- 54 Kelsey, J. E., Mt. Gambier, Adelaide.—Hops, grown in volcanic soil. 623

Water Animals, Fish Culture, and Apparatus.

- 55 Cardwell, Robert, Port Essington, northern territory of South Australia.—Trepang, cured at the fishery, Port Essington, northern territory of South Australia. 644

Animal and Vegetable Products.

- 56 Kemp, W., Adelaide.—Sheepskin mats. 652
- 57 Angas, J. H., Collingwood, West Adelaide.—Sheepskins; skins of the spotted emu, and other animals indigenous to South Australia, made up in designs. 652
- 58 South Australian Commissioners, Adelaide.
- a* Dressed skins of the kangaroo, wallaby, and other indigenous animals. 652
 - b* Emu eggs. 653
 - c* Raisins, plums, figs, and currants. 656
 - d* Wines. 660
- 59 Davenport, Samuel, Adelaide.
- a* Skins of native animals and birds. 652
 - b* Emu eggs. 653
- 60 Bagot, E. M., Adelaide.—Extract of meat. 656
- 61 Hardy, Thomas, Adelaide.
- a* Raisins and currants. 656
 - b* Wine. 660
- 62 Murray, Alexander, West Adelaide.—Jams, jellies, and marmalades. 656
- 63 Dunn, John, & Co., Adelaide.—Flour. 657
- 64 Magarey, Thomas, & Co., Adelaide.—Flour. 657
- 65 Cowan, Thomas, & Co., West Adelaide.—Flour. 657
- 66 Gilbert, Joseph, Pewsey Vale, Adelaide.—Wine. 660
- 67 Clark & Crompton, Adelaide.—Wines. 660
- 68 Richman, J. W., Watervale, South Australia.—Wines. 660
- 69 Quick, H. C., Marden, Adelaide.—Wines. 660
- 70 Ross, R. D., Highercombe, Adelaide.—Wines. 660
- 71 Kaines, John H., Adelaide.—Wines. 660
- 72 Auld, Patrick, Magill, Adelaide.—Wines. 660
- 73 Barnard, G. L., Adelaide.—Wines. 660
- 74 Hornabrook, C. A., Adelaide.—Wines. 660
- 75 White, George, Rosefield, Adelaide.—Wines. 660
- 76 Baker, Isabella, Morialta, Adelaide.—Wines. 660

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INTERNATIONAL EXHIBITION,
1876.

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- I. DEPARTMENT OF MINING AND METALLURGY.
- II. DEPARTMENT OF MANUFACTURES.
- III. DEPARTMENT OF EDUCATION AND SCIENCE.

MAIN BUILDING.—PART II.

PHILADELPHIA :
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Wines, Textiles, Agricultural Machines, Fertilizers.

- 77 Gillard, Joseph, Adelaide.—Wines. 660
- 78 Ind, G. F., Paradise, Adelaide.—Wines. 660
- 79 Foote, Henry, Adelaide.—Wines. 660
- 80 Holbrook, J. D., Adelaide.—Wines. 660
- 81 Kelly, Dr., Tintara, Adelaide.—Wines. 660
- 82 Salter, W., & Son, Saltram, Adelaide.—Wines. 660
- 83 Davenport, Samuel, Beaumont, Adelaide.—Wines. 660
- 84 Martin, James, Gawler, Adelaide.—Wines. 660
- 85 Thornber, Unley, Adelaide.—Wines. 660
- 86 Wright, E. W., Horne Park, Adelaide.—Wines. 660
- 87 Bickford, A. M., & Sons, Adelaide.—Bitters, quinine wine, and lime-juice cordial. 660
- 88 Davis, F. C., Adelaide.—Bitters and cordials. 660
- 89 Nitschke, W., Adelaide.—Cordials and liqueurs. 660

Textile Substances of Vegetable or Animal Origin.

- 90 Angas, J. H., Collingrove, Adelaide.—Wool. 667
- 91 Keynes, Joseph, Keynton, Adelaide.—Wool. 667
- 92 Murray, John, Murrayvale, Adelaide.—Wool. 667
- 93 Graham, Thomas, Adelaide.—Wool. 667
- 94 Browne, W. J., Moorak, Adelaide.—Wool. 667
- 95 Hayward, Armstrong, & Co., Woonoka, Adelaide.—Wool. 667
- 96 McFarlane, Allan, Wellington Lodge, Adelaide.—Wool. 667
- 97 Wurm, Frederick, Adelaide.—Silk and silk cocoons. 668

Machines, Implements, and Accessories of Manufacture.

- 98 South Australian Commissioners, Adelaide.—Reaping machine. 672

Agricultural Engineering and Administration.

- 99 Dalwood, W. F., Adelaide.—Guano from Browse Island, off west coast of Australia. 681

NEW ZEALAND.

(North of Nave, Columns 10 to 17.)

Chemicals, Ceramics, Woven Goods, Fancy Articles.

Chemicals.

- 1 Horter, John, Woolston, Canterbury.—Soap and mould candles. 201
- 2 Inness, W. M., Port Chalmers, Otago.—Cod-liver oil. 201
- 3 Louisson, T. B., Nelson.—Paint made from hematite ore. 202
- 4 Johnstone Brothers, Nelson.—Umber and red pigments made from hematite ore. 202
- 5 Grayling, W. S., Taranaki.—Extract of towai (*Weinmannia racemosa*); extract of inau (*Elæocarpus dentatus*). 202

Ceramics—Pottery, Porcelain, Glass, etc.

- 6 Kennedy Bros., Nelson.—Fire bricks. 207

Furniture and Objects of General Use in Construction and in Dwellings.

- 7 Greenfield & Stewart, Wellington.—Panel door made of rimu (*Dacrydium cupressinum*). 227

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 8 Government of New Zealand.—Specimens of fabrics made from Phormium tenax. 233

Woven and Felted Goods of Wool, etc.

- 9 Webley Bros., Nelson.—Nelson tweeds made from New Zealand wool. 235
- 10 Cook, James, Nelson.—Woolen rugs, woven and dyed at Nelson. 239

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 11 Taylor, B. K., Wanganui.—Hat made of kickie (cordyline). 251
- 12 Liardet, H. E.—Fancy articles made from feet and bones of sea birds. 254
- 13 Taylor, Mrs. Richard, Wanganui.—Ornamental satchel and table mat. 254
- 14 Liardet, Hector Evelyn, Wellington.—Feather furs. 256
- 15 Woon, R. W., Wanganui.—Garments and ornaments of the Maoris. 257

Vegetable Fabrics, Maps, Photographs, Forest and Agricultural Products.

- 16 Government of New Zealand.—Garments and ornaments of the Maoris. 257
- 17 National Museum at Washington, J. Henry, Secretary.—Garments of the Maoris. 257

Weapons, etc.

- 18 Woon, R. W., Wanganui.—Collection of weapons of the Maoris. 268

Fibres of Vegetable, Animal, or Mineral Materials.

- 19 Moyle, Edward, Taranaki.—Cord made from Phormium tenax. 287
- 20 Bevan, Thomas, jr., Otaki, Wellington.—Rope made from Maori dressed phormium, fish line, horse halter, lead line, twine. 287
- 21 Bevan & Sons, Otaki, Wellington.—Cord and twines made from Maori dressed phormium. 287
- 22 Kinross & Co., Hawke Bay.—Cordage and twines made from Maori dressed phormium. 287
- 23 Grant & Co., Otago.—Cordage made from phormium. 287
- 24 Auckland Patent Steam Rope Co.—Phormium rope. 287
- 25 Canterbury Flax Association, Christchurch.—Tarred and untarred cordage made from phormium. 287
- 26 Lennon, T., Christchurch.—Cordage, ropes, and twines, made from phormium. 287
- 27 Cook, James, Nelson.—Mats and matting made from phormium. 287
- 28 Simons & Malcolm, Nelson.—Door mats made from phormium. 287
- 29 Government of New Zealand.—The New Zealand flag. 288

Engineering, Architecture, Maps, etc.

- 30 Tatton, P. W., Nelson.—Geological map of the province of Nelson. 335
- 31 Government of New Zealand.—Geological map of New Zealand, by James Hector; topographical map of New Zealand, by Louis Koch. 335
- 32 Geological Survey Department, James Hector, Director.—Geological plans and sections. 335
- 33 Public Works Department.—Sketch map, by John Carruthers, engineer-in-chief, showing railways, roads, and water-races made and in course of construction. 335

Physical, Social, and Moral Condition of Man.

- 34 National Museum, Washington, J. Henry, Secretary.—Paddles of Maoris; skulls of Maoris and Morcori from the Chatham Islands. 340
- 35 Woon, R. W., Wanganui.—Paddles of the Maoris. 340
- 36 Government of New Zealand.—Statistics and census of New Zealand for 1874, prepared by W. R. E. Brown, Registrar-General. 345

Photography.

- 37 Burton Bros., Dunedin.—Views of scenery of South Island. 430
- 38 Government of New Zealand.—Views of scenery, etc. 430
- 39 Tarawaki Committee.—Views of New Plymouth and surrounding country. 430
- 40 Mundy, D. L.—Views of scenery, foliage, buildings, gold mining, etc. 430

Railway Plant, Rolling Stock, etc.

- 41 Government of New Zealand.—Photographs of engines as used in New Zealand. 570

Arboriculture and Forest Products.

- 42 Cruickshank, J. D., Upper Hull Saw Mills, Wellington.—Section of trunk of rimu (*Dacrydium cupressinum*), red pine of settlers. 600
- 43 Westland Committee.—Specimens of woods with bark. 600
- 44 Royal Gardens, Kew, England, Joseph Hooker, Director.—Collection of woods. 600
- 45 Taranaki Committee.—Specimens of woods. 601
- 46 Black, W. B., American Coach Factory, Wellington.—Specimens of woods. 601
- 47 James, W., Wellington.—Specimens of woods. 601
- 48 Grayling, W. S., Taranaki.—Bark of hinau. 602
- 49 Taranaki Committee.—Barks of the atawhero and the pukatea. 602
- 50 Colonial Museum, Wellington, James Hector.—Tanbarks, native to New Zealand. 602
- 51 Grayling, W. S., Taranaki.—Blue earth, used by Maoris, mixed with shark oil, as blue paint. 602
- 52 Taranaki Committee.—Earth used by Maoris as a mordant for dyes. 602
- 53 Walker, R., & Co., Auckland.—Kauri gum. 603
- 54 Forbes, R. W., New York.—Kauri gum. 603
- 55 Henry, J., & Co., Taranaki.—Dried ferns. 604
- 56 Taranaki Committee.—Fungus exported as food to China; esculent fern root; birds' nest fungus and curious parasite. 604

Agricultural Products.

- 57 Banks, E. H., Christchurch.—Oats and other cereals. 620
- 58 Wood, W. D., Christchurch.—Wheat. 620
- 59 Cunningham, P., & Co., Christchurch.—Wheat grown in Canterbury. 620
- 60 Ruddenkhan, J. G., Addington, Canterbury.—Wheat. 620
- 61 Hooper & Dodoon, Nelson.—Hops. 623
- 62 Wilkins, Robert, Christchurch.—Perennial rye grass and cocksfoot seed. 624

Animal and Vegetable Products, Textiles, Plants.

- 63 Armstrong, J. B., Christchurch.—
Phormium seeds. 624

Animal and Vegetable Products.

- 64 Wilson, Thomas, Woolston, Canterbury.—Saddle, harness, and shoemakers' leather; fancy colored skins for shoemakers and bookbinders. 652
- 65 Armitage, Taranaki.—Dressed kip and calf leather. 652
- 66 Morris, Thomas, Oamaru, Otago.—Gentleman's town saddle. 652

Natural History Specimens.

- 67 National Museum, Washington, J. Henry, Secretary.
a Specimens of kiwi (*Aptery Australis*).
b Egg of the kiwi. 653
- 68 Gilmour, John, Christchurch.—Hams and bacon. 656
- 69 New Zealand Provision and Produce Company, Christchurch.—Preserved meats. 656
- 70 Nairn, David, Addington, Canterbury.—Tomato sauce. 656
- 71 Trent Brothers, Woolston, Canterbury.—Chicory in different stages of preparation. 657
- 72 Smith, James, Nelson.—Fruit wines. 660
- 73 Henderson & Farrah, Wanganui.—Ale and porter. 660

Textile Substances of Vegetable or Animal Origin.

- 74 Chinnery, Charles, Addington, Canterbury.—Phormium fibre. 666
- 75 Taranaki Committee.—Phormium. 666
- 76 Forbes, R. W., New York.—Phormium. 666
- 77 Bevan, Thomas, jr., Otaki.—Hank of phormium. 666
- 78 Peter, W. S., Anama, Ashburton, Canterbury.—Merino wool. 667
- 79 Bealey, Samuel, Canterbury.—Merino and Romney Marsh wool. 667
- 80 Rutherford, A. W., Amuri, Nelson.—Merino wool. 667
- 81 Anstey, G. A., Amuri, Nelson.—Merino wool. 667
- 82 Wason, J. Cathcart, South Rakaia, Canterbury.—Wools. 667
- 83 Hall, John, Hororata, Canterbury.—Merino wool. 667
- 84 Rickman, F. M., Rangiora, Canterbury.—Romney Marsh wool. 667
- 85 Braithwaite, Arthur, Hutt, Wellington.—Romney Marsh wool. 667

Horticulture.

- 86 Coates, Laning, Christchurch.—Live ferns. 707

CAPE OF GOOD HOPE.—STATISTICAL PREFACE.

THE colony of the Cape of Good Hope is bounded north and northeast by the Orange river, which divides it, in parts of its course, from the Free State; east and northeast by the Tecs, a small tributary of the Orange, the Stormbergen Mountains, and the Indwe and Great Kei, which two rivers separate the Cape Colony from Kaffirland; on the south it is bounded by the Indian Ocean, and on the west by the Atlantic. Latitude $28^{\circ} 10'$ to $34^{\circ} 51'$ south; longitude $16^{\circ} 20'$ to $28^{\circ} 20'$ east. The breadth on the greatest meridian is about 450 miles, the length on the largest parallel about 600 miles, and the total area is about 201,000 square miles. The colony is generally considered as forming two sections, the Western and Eastern Provinces, each divided into 16 electoral divisions, which are again subdivided for fiscal and magisterial purposes. The first regular census (1865) gave the following result as to the numbers of the population:

White, or European,	181,592
Hottentot,	81,598
Kaffir,	100,536
Other colored,	132,655
	<hr/>
	496,381

Since the census, the annexation of British Kaffraria, Basutoland, Fingoland, and Normansland, added 5847 whites and 273,930 colored to the population, making the total, 776,158.

Hydrographically, the country, as a whole, is decidedly superior to most parts of Africa. The seaboard presents several comparatively safe and commodious harbors. Of these, however, two—Table Bay in the Western Province, and Algoa Bay in the Eastern—absorb nearly the whole of the foreign trade. Hardly any of the ports command navigable communication with the interior.

The highest range of mountains within the colony is 9000 feet above the sea. The dividing ridge runs parallel with the coast at a distance of 100 miles. Between the principal range and the sea, on the east, there are two other ranges, less continuous and regular; the intermediate one generally more distant from the first than they are from each other.

The prevalent winds—the southeast in summer, and the northeast in winter—mitigate each the rigor, whether heat or cold, of its own season; and, in spite of occasionally sudden and great changes, render the temperature, as a whole, one of the most salubrious and delightful in the world. The mean temperature of the year at Cape Town is about 68° F.; that of the coldest month being 57°, and of the hottest, 79°.

The value of the total exports and imports of the Cape Colony, including British Kaffraria, was, in 1873, as follows:

Imports,	£5,451,927
Exports,	4,011,327

Among the articles of export, wool is the most important, forming nearly nine-tenths of the total. Among the other leading items are copper ore, feathers, and sheepskins.

There were, at the end of 1865, in the colony, 692,514 head of cattle and 9,836,065 sheep. The sheep farms are often of very great extent, comprising from 3000 to 15,000 acres and upwards. Those in tillage are comparatively small. The graziers are, for the most part, proprietors of the farms they occupy, paying a quit rent to government, as the original owner of the soil.

There were lines of railways of a total length of 134 miles at the end of 1874, and a system of other main lines, as well as of telegraphs, was under consideration by the government.

The constitution vests the executive in the Governor and an Executive Council, composed of certain officeholders appointed by the crown. The legislative power rests with a Legislative Council of 21 members, and a House of Assembly of 66 members.

The income and expenditure of the colony, during 1873, were as follows:

Revenue,	£2,078,220
Expenditure,	2,159,658

Included in the above receipts is a loan of £859,000 for public works. The public debt, on the 1st of January, 1875, amounted to £1,723,144.

Commissioner from the CAPE OF GOOD HOPE to the International Exhibition:

MR. H. CRAWFORD COATES, Executive Commissioner.

CAPE OF GOOD HOPE.

(North of Nave, Columns 10 to 17.)

COLLECTIVE EXHIBIT.

Metallurgy, Furniture, Aboriginal Utensils, Maps, Books.

Minerals, Ores, Stone, Mining Products.

- 1 Cape Copper Mining Co. (limited), Cape Town.—Copper ores from Ookiep, Spectakel, Narap, Karolusburg, and Kilderman mines, Little Namagualand. 100
- 2 Bright, H. C. R., Mowbray, near Cape Town.—Copper ores and collection of minerals. 100
- 3 Dickson, W. W., Cape Town.—Black oxide of manganese, from Hercules mine. 100
- 4 Barry & Herdon, Mossel Bay.—Diamonds and associated rocks. 100
- 5 Wise, G., Stormberger.
a Saltpetre from the Stormberger. 100
b Coal from the Stormberger. 101
- 6 Wilson, A., Gas Works, Cape Town.—South African coals, cokes, and ashes. 101

Metallurgical Products.

- 7 Cape Copper Mining Co. (limited), Cape Town.—Copper. 111

Chemical Manufactures.

- 8 Smithers, J. & G., Cape Town.—Soaps. 201

Furniture, and Objects of General Use in Construction and in Dwellings.

- 9 Moulton, R., Suellendam.—Work-box constructed of South African woods. 217
- 10 Lesar, W., Cape Town.—Table constructed of various colonial timbers. 217

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 11 Perry, Mrs., Cape Town.—Melon seed necklaces, bracelets, etc. 252
- 12 Gladwin, J. P., Kafirland.—Hair of Pandomise, surmounted by ring of Euphobia sap; ivory earrings of Pandomis balon skin; dress of witch doctor. 253
- 13 Local Committee, Cape of Good Hope.—Native articles of dress—necklaces, armlets, aprons, head-dress earrings, etc. 253

Weapons, etc.

- 14 Barry & Herdon, Mossel Bay.—Kafir assegais. 268
- 15 Local Committee of Cape of Good Hope.—Knoke kierie of rhinoceros horn. 268
- 16 Vigors, P., Cape Town.—Native weapons, Kafir assegais, Bushman axe. 268

Medicine, Surgery, Prothesis.

- 17 Auret, W. H., Paarl.—Vegetable drugs and medicines. 272
- 18 Barkly, Sir H., Governor of Cape Colony.—Bitter barks used by Kafir doctors in fever cases. 272

Fabrics of Vegetable, Animal, or Mineral Materials.

- 19 Local Committee of Cape of Good Hope.—Kafir beer and milk pots, Kafir and basuto baskets. 289

Educational Systems, Methods, and Libraries.

- 20 Salomon, C., Cape Town.—Map of South Africa. 300
- 21 Barry & Herdon, Mossel Bay.
a Map. 300
b Specimens of ornamental bookbinding. 306
- 23 Salomon, Saul, & Co., Cape Town.—Specimens of bookbinding. 306
- 24 Local Committee of Cape of Good Hope.—Catalogue of South African Public and Sir G. Grey's libraries; University calendar; reports of South African Museum, Public Library, and Botanic Gardens; Dr. Blerk's Bushman Researches. 306
- 25 Juta, J. C., & Co., Cape Town.—Books. 306
- 26 Mabile, A., Morija, Basutoland.—Books printed, bound, and published at Morija Mission Station, Basutoland. 306
- 27 Stewart, G., Lovedale, Kafirland.—Books printed, bound, and published at the Lovedale Kafir Mission Institution. 306

Art, Agricultural, Animal, Vegetable Products, Textile Substances.

Engineering, Architecture, Maps, etc.

- 28 Local Committee of Cape of Good Hope.—Models of harbor works and dry docks at Cape Town. 330
- 29 Dunn, E. I., Cape Town.—Geological sketch map of Cape Colony. 335

Paintings.

- 30 Hermann, W., Cape Town.—Oil paintings. 410
- a* View in Krysna Forest, Cape Colony.
- b* View of Three Anchor Bay, near Cape Town.
- 31 Coppen, F., Cape Town.—Water color sketches. 411
- a* Sketch of Hangklip, a spur of the Stormbergen, Queenstown Division.
- b* Sketch of the Mac Mac Falls, Lydenburg gold fields, South African Republic.
- 32 Hays, Miss Anna, Cape Town.—Water color sketch of the native population of Cape Town. 411
- 33 Hermann, W., Cape Town.—Six water color sketches of colonial scenery. 411
- 34 Thwaites, Miss F. C., Cape Town.—Six water color drawings of indigenous Cape flowers. 411

Engraving and Lithography.

- 35 Barry & Herdon, Mossel Bay.—Pictures and photographs. 430
- 35 *a* Bruton, C. I., Cape Town.—Photographs. 430
- a* Views in Cape Town.
- b* View of Kloof Lodge, near Cape Town.
- c* Views of scenery ground.
- 35 *b* Barnard, S. B., Cape Town.—Photographs of Cape Town, natives, etc., in a book. 430
- 35 *c* Fenneysey, C. D., George.—Photographs of colonial scenery. 430

Arboriculture and Forest Products.

- 36 Carson, E. J., Ookiep, Namagualand.—Ebony. 601
- 37 Holland, B. H., Alexandria, Cape Colony.—Specimens of timber from the Alexandria brown forests, with articles made from various woods. 601
- 38 Mossop & Garland, Cape Town.—Barks in the rough and ground. 602
- 39 Smithers, J. & G., Cape Town.—Vegetable wax. 603
- 40 Dale, Dr., Cape Town.—Vegetable wax. 603

Agricultural Products.

- 41 Barry, Arnold, & Co., Cape Town.—Wheat. 620
- 42 Myburgh, N., Meerlust, Ersle River.—Wheat. 620
- 43 Barry & Herdon, Mossel Bay.—Aloes. 623
- 44 Barry & Nepheus, Cape Town.—Aloes. 623
- 45 Jongh, S. J. de, Cape Town.—Snuff. 623
- 46 Powrie, E., Mossel Bay.—Leaf tobacco and snuff. 623

- 47 Gibbon, J. M., Cape Town.—Cochineal, grown and dried in the Botanic Gardens, Cape Town. 638

Water Animals, Fish Culture, and Apparatus.

- 48 Merriman, John, Cape Town.—Preserved crayfish from Table Bay. 643
- 49 Modie, D., Suellendam.—Pearl oyster shells from the south coast of the colony. 645

Animal and Vegetable Products.

- 50 Dier & Diets, Port Elizabeth.—Skins. 652
- 51 Mossop & Garland, Cape Town.—Leather. 652
- 52 Local Committee, Cape of Good Hope.—Skins of the blackbacked jackal and aard wolf. 652
- 53 Dickson, W. W., Cape Town.—Skins of the lion and cheelat or hunting leopard. 652
- 54 Vigors, P., Cape Town.—Lion and leopard skins, head of a leopard, antelope and rhinoceros horns. 652
- 55 Local Committee of Cape of Good Hope.—Ostrich feathers and eggs. 653
- 56 Barry & Herdon, Mossel Bay.—Ostrich incubator, with stuffed ostriches and eggs. 653
- 57 Powrie, E., Mossel Bay.—Beeswax. 654
- 58 Barry & Nepheus, Cape Town.—Beeswax. 654
- 59 Toit, A. L. du, Rondolbosch.—Grapes in brandy. 656
- 60 Merve, J. H. von der, Robertson.—Grapes in brandy. 656
- 61 Falck, J. A. H., Montaga.—Peaches in brandy. 656
- 74 Ryn, J. H. Ivan, Cape Town.—Pontac, red, and white wines. 660
- 75 Reenen, S. van, & Co., High Constantia.—Red and white wines. 660
- 76 Anderson & Murrison, Cape Town.—Pontac, pale, and golden sherry wines. 660
- 77 Green, J. K., Cape Town.—Red, white, and sherry wines. 660
- 78 Collison, H. C., Cape Town.—Sherry, Madeira, pontac, and Constantia wines. 660
- 79 Joubert, W. A., Stellenbosch.—Dry white wine. 660
- 80 Paarl Wine and Brandy Co., Paarl.—Red and white wines. 660
- 81 Rosenberg, S., Cape Town.—Brandy. 660
- 82 Barry & Nepheus, Cape Town.—Brandy. 660
- 83 Barry & Herdon, Mossel Bay.—Constantia wine and vinegar. 660
- Textile Substances of Vegetable or Animal Origin.**
- 84 Grewar, John W., Uitenhage.—Wool. 667
- 85 Priest, W., Graff Reinet.—Wool. 667

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SMALL WARES,

ETC., ETC.

Textile Substances, Vegetable Products, Flower Ornaments.

- | | |
|---|--|
| <p>86 Rubidge, C., Graff Reinet.—Wool. 667</p> <p>87 Stewart, A. C., Port Elizabeth.—Wool. 667</p> <p>88 Court, P. W., Port Elizabeth.—Wool. 667</p> <p>89 Barry & Nepheus, Cape Town.—Wool. 667</p> <p>90 Barry, Arnold, & Co., Cape Town.—Wool. 667</p> <p>91 Dier & Diets, Port Elizabeth.—Wool. 667</p> <p>92 Barry & Herdon, Mossel Bay.
 <i>a</i> Wool. 667
 <i>b</i> Mohair. 669</p> <p>93 Stewart, A. C., & Co., Port Elizabeth.—Angora hair. 669</p> <p style="text-align: center;">Ornamental Trees, Shrubs, and Flowers.</p> <p>94 Villiers, Miss de, Franche Hoek.—Articles made of everlasting flowers. 709</p> <p>95 Smuts, Miss G., Cape Town.—Article made of everlasting flowers. 709</p> | <p>96 Volstedt, P. J., Cape Town.—Preserved lemons, citrons, nartjes, bitter oranges, melons, and Cape gooseberries. 656</p> <p>97 Merriman, John, Cape Town.—Preserved tomatoes and Cape gooseberries. 656</p> <p>98 Clear, E., Cape Town.—Wheat flour. 657</p> <p>99 Lettersteat & Co., Cape Town.—Wheat flour. 657</p> <p>100 Barry, Arnold, & Co., Cape Town.—Wheat flour. 657</p> <p>101 Heindenrych, B. G. P., Cape Town.—Starch from wheat flour. 658</p> <p>102 Ryn, J. H. Ivan, Cape Town.—Brandy. 660</p> <p>103 Collison, H. C., Cape Town.—Cognac. 660</p> <p>104 Hauf, Dr., Robertson.—Brandy. 660</p> <p>105 Marais, H. H., Robertson.—Cape sherry wine and congo brandy. 660</p> <p>106 Villiers, A. J. J. de, Cape Town.—Sherry, port, and red wines. 660</p> <p>107 Villiers, A. B. de, Paarl.—Red and white wines. 660</p> |
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JAMAICA.—STATISTICAL PREFACE.

JAMAICA, one of the West India Islands, and by far the most important of those belonging to Great Britain, is about 90 miles to the south of Cuba, and stretches in north latitude between $17^{\circ} 40'$ and $18^{\circ} 30'$, and in west longitude between $76^{\circ} 15'$ and $78^{\circ} 25'$. Area, 6900 square miles; population (in 1871), 506,154, of whom less than three per cent. were white. The greatest length of the island is 150 miles, and its greatest breadth, 50 miles. It is traversed from east to west by a heavily timbered ridge called the Blue Mountains, which rises to about 7000 feet. From this range at least 70 streams descend to the north and south shores; one of these, the Black river, affords for small craft a passage of about 30 miles into the interior. The others, owing to the shortness and declivity of their course, are not navigable. Excellent harbors are everywhere to be found. The best of these is formed by a deep and capacious basin, in the southeast quarter of the island, which washes the most spacious and fertile of the plains between the hill country and the coast. Around this inlet, and within a few miles of each other, are all the considerable centres of population, Port Royal, Kingston, and Spanish Town.

The climate varies considerably, the torrid belt of the coast gradually passing into the temperate region of the central heights. The latter is said to be remarkably favorable to longevity; and, after having long been a retreat for the residents themselves, it has lately begun to attract invalids from the United States. To contrast two positions—the one near Kingston harbor, the other at an intermediate elevation of 4000 feet—their annual mean temperature are stated to be respectively 81° F. and 68° F.

In 1871 the chief exports were in value as follows: Sugar, £502,193; rum, £271,267; coffee, £147,562; logwood, £115,423; while the chief imports were: Flour, £135,500, and salt-fish, £92,801. During the same year the revenue amounted to £434,564; the expenditure to £430,154.

The sum of £19,403 was devoted to the support of the schools during the year 1872.

JAMAICA.

(North of Nave, Columns 10 to 17.)

COLLECTIVE EXHIBIT.

Manufactures and Agricultural Products.

Chemical Manufactures.

- 1 Reynolds, John N.—Salt. 200
- 2 Frith & Murphy.—Salt. 200
- 3 Grant, Charles.
 - a Bisulphate of lime. 200
 - b Chewstick powder and odontine. 203
- 4 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.—Essential oils. 203
- 5 Auvray, P. E.—Odontine. 203

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 6 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.—Palm and plantain leaf mats. 229

Clothing, Jewelry, etc.

- 7 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
 - a Palm leaf hats. 251
 - b Baskets and fans from leaves; shell baskets; walking sticks; bamboo whip; tortoise shell combs and necklaces; napkin rings and egg cups; doilies and fans made of lace bark. 254
- 8 Brooks, Mrs. G.—Doilies and fans made from lace bark, etc. 254

Paper, Blank Books, and Stationery.

- 9 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
 - a Rulers. 258
 - b Paper stock. 260

Medicine, Surgery, Prothesis.

- 10 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.—Cinchona, jalap, senna, aloes. 272

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 11 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.—Razor strops made from stems of plants. 281

Fabrics of Vegetable or Mineral Materials.

- 12 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
 - a Brushes from the penitentiary. 286
 - b Ropes from sisal hemp; coir; wild cotton, cocoanut, etc. 287
 - c Bamboo baskets. 289

Carriages, Vehicles, and Accessories.

- 13 Brass, John, & Son.—Carriage harness and riding saddle. 296

Arboriculture and Forest Products.

- 14 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
 - a Cedar, lignum vitæ, oak, bamboo, etc.; cedar and juniper shingles; pimento leaves and berries, and juniper wood, etc., for making perfumery; lace, cedar, and penguin barks. 600
 - b Mahogany, ebony, satinwood, rosewood, etc. 601
 - c Logwood, fustic, annatto, turmeric, etc.; diri-diri, mangrove, catechu, etc. 602
- 15 Pântrepant Estate.—Lace bark. 600

Agricultural Products.

- 16 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
 - a Peas and beans. 621
 - b Ginger, pimento, nutmegs, vanilla, cayenne pepper, etc.; tobacco, tea, cocoa, and chocolate; coffees from the following parties, John McLean, Francis Chalmer, John Davidson, Mrs. Maclaverty, Mrs. Lascelles, Dr. Stephens, James Harrison, Ernest Elliott. 623
- 17 Soutar & Co.—Tobacco and cigars. 623
- 18 Richards, W. S.—Coffee. 623

Animal and Vegetable Products.

- 19 Grant, Charles.—Beeswax. 654
- 20 Brass, John, & Son.—Honey and beeswax. 654

Animal and Vegetable Products, Textile Substances.

- 21 Auvray, P. E.—Bleached wax. 654
- 22 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
- a* Candied fruits and preserves; pickles, etc.; fruits preserved in alcohol; meal made from plantains, bananas, cassava, bread, and other fruits. 656
- b* Corn, rice, and flour. 657
- c* Starch, arrowroot, etc. 658
- d* Sugars from the following parties: W. S. Richards, Albion estate; Louis Verley, Mona estate; Ernest Elliott, Bog estate; James Harvey, Hillside estate; Joseph Reed, Caymannas estate. 659
- e* Runis from the following parties: David Galloway, Vale Royal estate; William Vickers, Frome and other estates; M. C. Morgan, Appleton estate; James Harrison, Hordley and other estates; Plato Elphick, Belvidere estate; W. S. Richards, Hope-well estate; Ernest Elliott, Bog and other estates; Louis Verles, Mona estate; C. W. Steer, Blenheim estate; F. Hall, Mexico estate; James Harvey, Hillside estate; Joseph Reed, Camanas estate; J. Wray & Nephew, George J. Peynado, Alberga & Mitchell. 660
- f* Cocoanut, castor, groundnut, and other oils. 662
- 23 Gadpaille, Charles.—Rum. 660
- 24 Melville James.—Rum and Falernian wine. 660
- 25 Desnoes, P., & Son.—Rum, ginger cordial, orange wine, pimento dram, etc. 660
- 26 Nunes, Robert.—Rum. 660
- 27 King, Alexander, & Co.—Rum and lime-juice. 660

Textile Substances of Vegetable or Animal Origin.

- 28 Thomson, Robert, Superintendent of Botanical Gardens, Kingston, for the government.
- a* Wild cotton. 665
- b* Sisal hemp, China grass, pineapple, coir, bamboo, etc. 666

CANADA.

(North of Nave, Columns 16 to 23.)

Chemical Manufactures.

Chemical Manufactures.

- 1 Cowan, A., Brockville, Ont.—Salt, nitre cake; nitric, muriatic, and sulphuric acids; sodium nitrate. 200
- 2 Gray, Young, & Spaulding, Seaforth, Ont.—Salt. 200
- 3 Coleman & Garnishlock, Seaforth, Ont.—Salt. 200
- 4 Stapleton Salt Works, Clinton, Ont.—Salt. 200
- 5 International Works, Goderich, Ont.—Salt. 200
- 6 Tecumset Works, Clinton, Ont.—Salt. 200
- 7 Pratt, Samuel, Clinton, Ont.—Salt. 200
- 8 Bruce Salt Co., Kincardine, Ont.—Salt. 200
- 9 Gray & Scott, Kincardine, Ont.—Salt. 200
- 10 Harrison & Evans, Goderich, Ont.—Salt. 200
- 11 Merchants' Salt Co., Seaforth, Ont.—Salt. 200
- 12 Geological Survey, Canada, Q.—Salt, salt cake, salt gypsum cake, residue for crystallizing pans, salt scales. 200
- 13 Mercer, Thomas, Cardwell, N. B.—Salt. 200
- 14 Sharp, Jos. S., Apohaqui, N. B.—Salt. 200
- 15 Shaw, P., Quebec, Q.—Carbonate of potassium. 200
- 16 Povat, John S., Markham Village, Ont.—Sulphate of ammonium. 200
- 17 Cooper, Robt., Toronto, Ont.—Washing crystals. 200
- 18 Lane, T. G., Hamilton, Ont.—Washing and bleaching crystals. 200
- 19 Saunders, Wm., London, Ont.—Pharmaceutical preparations. 200
- 20 Lyman, Clare, & Co., Montreal, Q.—Pharmaceutical preparations. 200
- 21 Evans, Mercer, & Co., Montreal, Q.—Pharmaceutical preparations. 200
- 22 Lyman Bros. Co., Toronto, Ont.
- a* Pharmaceutical and chemical preparations. 200
- b* Oil for paints. 201
- c* Paints in oil. 202
- 23 Lyman, Clare, & Co., Montreal, Q.—Oil. 201
- 24 Savage, Alfred, & Son, Montreal, Q.—Oil. 201
- 25 Morse, Geo. D., & Co., Toronto, Ont.—Soap, candles, tallow, lard, and oils. 201
- 26 Victoria Manufacturing Co., Toronto, Ont.—Toilet soaps. 201
- 27 Barsalou Soap Works, Montreal, Q.—Soaps. 201

Chemical Manufactures, Brick, Pottery.

- | | |
|--|--|
| 28 Hood, A. W., & Son, Montreal, Q.—
Soaps. 201 | 61 Hamilton Powder Co., Hamilton,
Ont.—Gunpowder in canisters. 204 |
| 29 Albert Toilet Soap Co., Montreal, Q.—
Soaps. 201 | 62 Manuvilling, J. J., Hampton, N. B.—
Matches. 204 |
| 30 Spinelli, R., Montreal, Q.—Paraf-
fine soaps. 201 | Ceramics—Pottery, Porcelain, Glass,
etc. |
| 31 Lyman, S. J., Montreal, Q.—Phos-
phorus soap. 201 | 63 Nightingale, Thos., Yorkville, Ont.—
Drain tiles. 206 |
| 32 Torrey, W. S., Moncton, N. B.—
Soaps and candles. 201 | 64 Bulmer & Douglas, Yorkville, Ont.—
Drain tiles, bricks. 206 |
| 33 Waterman Bros., London, Ont.—
Hard and soft coke from petroleum, crude
and refined petroleum, paraffine oil, ben-
zine, axle oil, tar from petroleum, paraf-
fine scales. 201 | 65 Spencer, H., Brantford, Ont.—Drain
tiles. 206 |
| 34 Beliveau Albertite & Oil Co., West-
moreland, N. B.—Mineral oil from Al-
bertite. 201 | 66 Riggins, George, Kincardine, Ont.—
Bricks. 206 |
| 35 Newton, James, Limehouse, Ont.—
Ferruginous rock and paints. 202 | 67 Russell, Samuel, London, Ont.—
Bricks. 206 |
| 36 Leeds Paint Manufacturing Co.,
Mallorytown, Ont.—Ferruginous rock and
paints. 202 | 68 Munn & Cochner, Dundas, Ont.—
Bricks. 206 |
| 37 McLure, David, Toronto, Ont.—
Printing and writing inks, lithographic var-
nish. 202 | 69 Robert & Leslie, Glenwilliam, Ont.—
Bricks. 206 |
| 38 Merrill & Flint, Elzyvir, Ont.—Iron
ochre purplish brown. 202 | 70 Townshend, Mrs. Mary, Yorkville,
Ont.—Bricks. 206 |
| 39 Buchanan Mineral Co., Walsing-
ham, Ont.—Paints and colors. 202 | 71 Anderson, Thomas, Bell's Corners,
Ont.—Bricks. 206 |
| 40 McKay, William, Ottawa, Ont.—
Liquid drier for paint, printers' ink. 202 | 72 Cashmore, Thos., Pembroke, Ont.—
Bricks for window jambs. 206 |
| 41 Lymans, Clare, & Co., Montreal, Q.—
Paints. 202 | 73 McGregor, Daniel, Pembroke, Ont.—
Bricks. 206 |
| 42 Ramsay, T., Montreal, Q.—Paints. 202 | 74 Baker, Wm., Arnprior, Ont.—
Bricks. 206 |
| 43 Carson, A., Quebec, Q.—Pigments,
limonite. 202 | 75 Coulter, Jas., Ramsay, Ont.—
Bricks. 206 |
| 44 Ramsay, A., & Son, Montreal, Q.—
Paints. 202 | 76 Metcalf, Jas., Ramsay, Ont.—
Bricks. 206 |
| 45 Montreal Plumbago Mining Co.,
Montreal, Q.—Stove polish, crucibles. 202 | 77 Moore, Gilbert, Ramsay, Ont.—
Bricks. 206 |
| 46 Martin, Charles, Montreal, Q.—Stove
polish, crucibles. 202 | 78 Foshick, Eneas, Ramsay, Ont.—
Bricks. 206 |
| 47 Robertson, James, Montreal, Q.—
White lead, putty. 202 | 79 Workman, Hugh, Brantford, Ont.—
Bricks. 206 |
| 48 Hall, G. B., Quebec, Q.—Ochres. 202 | 80 Foster, W. A., Belleville, Ont.—
Bricks. 206 |
| 49 Robitaille, Dr., Quebec, Q.—Red
ochre. 202 | 81 Pratt, Charles, London, Ont.—Pot-
tery. 206 |
| 50 Carroll, E., St. Anne-du-Machiche,
Q.—Ochre. 202 | 82 Ahren, J. H., Paris, Ont.—Pot-
tery. 206 |
| 51 Geological Survey, Montreal, Q.—
Ochres. 202 | 83 Bell, David, Little River, Q.—
Drain tiles. 206 |
| 52 McDougall, John, & Sons, Three
Rivers, Q.—Ochres. 202 | 84 Mochan, Albert, St. John, Q.—
Bricks. 206 |
| 53 Copeland & McLaren, Montreal, Q.—
Iron oxide. 202 | 85 Bulmer & Sheppard, Montreal, Q.—
Bricks, drain tiles. 206 |
| 54 Burne, Chas. C., St. John, N. B.—Red
paint. 202 | 86 Geological Survey, Montreal, Q.—
Bricks. 206 |
| 55 Thompson, G. T., & Sons, St. John,
N. B.—White lead. 202 | 87 Advisory Board, Quebec, Q.—
Bricks. 206 |
| 56 Wilson, John, St. John, N. B.—
Soaps. 202 | 88 Frechette, A. B., Quebec, Q.—Pot-
tery. 206 |
| 57 Edgett, W., Pudsey's Point,
N. S.—Iron ochre. 202 | 89 Peel, Thos. W., Montreal, Q.—
Bricks. 206 |
| 58 Saunders, Wm., London, Ont.—Per-
fumery. 203 | 90 Horson, Walter, Quebec, Q.—Pot-
tery. 206 |
| 59 Victoria Manufacturing Co., To-
ronto, Ont.—Perfumery. 203 | 91 Bell, W. & D., Quebec, Q.—To-
bacco pipes. 206 |
| 60 Lyman, S. J., Montreal, Q.—Per-
fumery. 203 | 92 St. John Stoneware Factory, St.
John, Q.
a Stove lining fire bricks. 206
b Stone and Buckingham ware, etc. 210 |
| | 93 Lee Brothers, St. John, N. B.—
Bricks, drain tiles. 206 |

Ceramics, Glass, Furniture, Household Utensils.

- 94 Smith & Raye, Halifax, N. S.
a Bricks, drain tiles. 206
b Earthenware. 210
- 95 Jackson, Charles, Woodstock, N. S.
 —Bricks. 206
- 96 Gilpin, Edwin, Springville, N. S.—
 Bricks. 206
- 97 Westnote, Robert, Peterborough,
 Ont.—Earthenware. 210
- 98 Stone Chinaware Co., St. John, Q.—
 Pottery. 210
- 99 Cap Rouge Pottery Co., Quebec, Q.
 —Crockery ware. 210
- 100 Huber, Allen, Berlin, Ont.—Mir-
 ror. 214
- 101 Burlington Glass Co., Hamilton,
 Ont.—Assorted glassware. 215
- 102 Millichamp, Wm., Toronto, Ont.
 —Silver-plated show cases. 216
- 103 Booth, W., Toronto, Ont.—Sign
 painting on glass. 216
- 104 McAusland, J., Toronto, Ont.—
 Stained glass, figured work. 216
- Furniture and Objects of General Use
 in Construction and in Dwellings.**
- 105 Taylor, J. J., Toronto, Ont.—Bur-
 glar-proof safe. 217
- 106 McGaw & Burnet, Toronto, Ont.—
 Sideboard. 217
- 107 Riley & May, Toronto, Ont.—Bil-
 liard tables, etc. 217
- 108 Woovehead, George, London, Ont.
 —Sideboard. 217
- 109 Almonte Furniture Co., Almonte,
 Ont.—Bedroom set. 217
- 110 Premer, C., Treston, Ont.—Furni-
 ture. 217
- 111 Murphy, A. A., Montreal, Q.—Store
 stools. 217
- 112 Roy & Co., Montreal, Q.—Invalid
 mechanical chair. 217
- 113 Reinhardt, C., Montreal, Q.—Com-
 bination spring-bottom bedstead. 217
- 114 Reid, R., Montreal, Q.—Marble
 mantel piece. 217
- 115 Flaherty, Robert, & Co., St. John,
 N. B.—Fireproof safe. 217
- 116 Thomson, Jas., Montreal, Q.—Par-
 lor set. 217
- 117 Drum Cabinet Manufacturing Co.,
 Quebec, Q.—Parlor and bedroom sets,
 sideboard. 217
- 118 Whiteside, H., & Co., Montreal, Q.
 —Beds and mattresses. 217
- 119 Coe, G. T., & Co., Montreal, Q.
a Garden seat. 217
b Washing machines. 225
- 120 Canada Truss Factory, Montreal,
 Q.—Invalid chair. 217
- 121 Chapeau, Godfroi, Montreal, Q.—
 Fireproof safes, burglar-proof door. 217
- 122 Bennett, Jas., St. John, N. B.—
 Newspaper files. 217
- 123 Hutching & Co., St. John, N. B.—
 Mattresses. 217
- 124 McLaughlin, B. D., Fredericton,
 N. B.
a Reading desk. 217
b House door, etc. 227
- 125 Saunders, J., Guelph, Ont.—Toddy
 ladle. 218
- 126 Waudley, H., Yorkville, Ont.
a Crust stand. 218
b Stovepipe collars. 225
- 127 Fin, Finlay, St. John, N. B.—Silver
 knives, forks, spoons, ladles. 218
- 128 Blandford, H., Hamilton, Ont.—
 Mirror. 219
- 129 Ewing & Co., Toronto, Ont.
a Mirrors. 219
b Mouldings. 220
- 130 Dixon, A. H., Toronto, Ont.—Show
 cards. 219
- 131 Shantz, J. Y., Berlin, Ont.—Mir-
 ror. 219
- 132 Spence, John C., Montreal, Q.—
 Stained glass window. 219
- 133 Simays, E., Hull, Q.—Enamel
 work. 219
- 134 Eggington, Jos. A., Montreal, Q.—
 Cut and engraved glassware. 219
- 135 Wade, J. M., Montreal, Q.—Orna-
 ment on glass and wood. 219
- 136 Cockhurn, D., Ottawa, Ont.—
 Carved frame. 220
- 137 Petrie & Howie, Hamilton, Ont.—
 Gilding and ornamenting. 220
- 138 Pell, A. J., Montreal, Q.—
 Gilt frames. 220
- 139 Clifford, Mrs. J., Quebec, Q.—
 Leather oval frame. 220
- 140 Brown, J. T., St. John, N. B.—
 Frames, book rack. 220
- 141 Copp Bros., Hamilton, Ont.
a Stoves. 222
b Sad irons. 225
- 142 Moore, D., & Co., Hamilton, Ont.—
 Stoves, tubular lanterns. 222
- 143 Elliot, J. W., Toronto, Ont.—
 Stoves. 222
- 144 White, H. A., Hamilton, Ont.—
 Stovepipe damper. 222
- 145 Thomas, R., Toronto, Ont.—Cook
 stove. 222
- 146 Wexelburg & Co., Toronto, Ont.—
 Sheet metal elbows. 222
- 147 Smart, James, Brockville, Ont.—
 Stoves. 222
- 148 St. Lawrence Foundry, Levis, Q.—
 Tubular furnace. 222
- 149 Roberts, J. B., Indian Town, N. B.
 —Kerosene oil cooking apparatus. 222
- 150 Harris, J., & Co., St. John, N. B.
a Ship camboose. 222
b Iron mantels. 227
- 151 Trudeau, P., Ottawa, Ont.—Gas
 burner, globe, and gallery. 223
- 152 Plice, W. W., Petit Codioc, N. B.—
 Lantern and kettle combined. 223
- 153 Moore, D., & Co., Hamilton, Ont.—
 Tin and stamped ware. 224
- 154 Williams, E. M., & Co., Hamilton,
 Ont.—Tin and stamped ware. 224
- 155 Burrow, Chatterfield, & Co., St.
 Catherine's, Ont.—Tin work. 224
- 156 Meilleur & Co., Montreal, Q.—Re-
 frigerators. 224
- 157 Armstrong, J. R., Toronto, Ont.—
 Cooking stoves. 225

Furniture, Household Utensils, Woven Goods, Clothing.

- 158 Penton, Thos., Sarnia, Ont.—Combined cooking and heating engine. 225
- 159 Chown & Cunningham, Kingston, Ont.—Stoves and castings. 225
- 160 Cull, Ch., Cobourg, Ont.—Clothes mangle. 225
- 161 Elliott, T. C., Guelph, Ont.—Washing machine. 225
- 162 Whaly, R., Hespeler, Ont.—Washing machine. 225
- 163 Lawlor & Co., Montreal, Q.—Washing machines. 225
- 164 Hall, G. B., Quebec, Q.
a Washing machines. 225
b Blinds, etc. 227
- 165 Prowse Bros., Montreal, Q.—Steam mangle. 225
- 166 Cable, Bayard, & Co., Montreal, Q.—Clothes rack. 225
- 167 Peters, S., Quebec, Q.—House doors, sashes, etc. 227
- 168 Foster, S. A., & Son, St. John, N. B.—Fireproof shutters. 227
- 169 Risteen, G. C., & Co., Fredericton, N. B.—Sash, blinds, mouldings, etc. 227
- 170 Horsey, R. M., Kingston, Ont.—Light sheet metal work. 227
- 171 Wood, T. M., & Co., Toronto, Ont.—Venetian blind. 227
- 172 Brennan, M., Hamilton, Ont.—Sash, blind, doors, mouldings. 227
- 173 Sarge, H. J., Toronto, Ont.—Wood, turned and sawed. 227
- 174 Hastings & Peterkin, Toronto, Ont.—Wood, turned and sawed. 227
- 175 Woagant, H. S., Morrisburg, Ont.—Window shades. 227
- 176 Fontaine, J., Montreal, Q.—Hot-house windows. 227
- 177 Myers, James, St. John, N. B.—Turned work. 227
- 178 Fairbank & Hames, St. John, N. B.—Doors, blinds, sash, turned work. 227
- 179 Wilson, Gilmour, & Co., St. John, N. B.—Marbleized mantels and grates. 227
- 190 Barber & Co., Toronto, Ont.—Tweeds, flannels. 235
- 191 Toronto Tweed Co., Toronto, Ont.—Tweeds. 235
- 192 Rosamond Woolen Co., Almonte, Ont.—Cassimeres. 235
- 193 Taylor, Thomas H., & Co., Chat-ham, Ont.—Cloths and tweeds. 235
- 194 Taylor, R. F., & Son, Toronto, Ont.—Cloths, tweeds, doeskins, buckskins. 235
- 195 Mills & Hutchison, Montreal, Q.—Tweeds. 235
- 196 Paton Manufacturing Co., Sher-brooke, Q.—Cloths and tweeds. 235
- 197 Woodworth, A. L., St. John, N. B.—Woolen yarns. 235
- 198 Oxford Woolen Mills, Oxford, N. S.—Woolen goods. 235
- 199 Fisher, S. T., Toronto, Ont.
a Tweeds, buckskins, doeskins. 235
b Yarns, shirts, pants, clouds, scarfs, 238
- 200 Advisory Board, B. C., Victoria, Br. Col.
a Yarn made from wool of Rocky mountain goat. 235
b Indian blankets from wool of Rocky mountain goat. 237
- 201 Toronto Tweed Co., Toronto, Ont.—Flannels. 236
- 202 Willett, S. T., Chambly, Q.—Flannels. 236
- 203 St. John Woolen Mills, St. John, Q.—Flannels. 236
- 204 Cantlie, Ewan, & Co., Montreal, Q.—Plain and fancy flannels. 236
- 205 Hinger, H., Elmira, Ont.
a Blankets. 237
b White stocking yarn. 238
- 206 Barber & Co., Toronto, Ont.—Yarns, shirts, pants, clouds, scarfs. 238
- 207 Wardlaw, W., Galt, Ont.—Woolen yarns. 238
- 208 McDonald, Mrs. D. B., Montreal, Q.—Gobelin tapestry. 239

Silk and Silk Fabrics.

- 209 McConnell, Mrs. J. A., Quebec, Q.—Knitted silk stockings. 246

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 180 Dundas Cotton Mills Co., Hamil-ton, Ont.—Cotton fabrics. 230
- 181 Canada Cotton Manufacturing Co., Cornwall, Ont.—Domestics, ticking, bags, yarn, etc. 230
- 182 Hudon Cotton Mills, Hochelaga, Q.—Cotton sheeting and shirting. 230
- 183 Woodworth, A. L., St. John, N. B.—Cotton yarns. 230
- 184 Parks, W., & Co., St. John, N. B.—White and colored cotton yarns. 230
- 185 Hinger, H., Elmira, Ont.
a Canadian and Oxford gray cloth. 230
b Linen sheeting. 231
- 186 Stevens, A. J., & Co., Paris, Ont.—Floor oil cloth. 234
- 187 Dominion Oil Cloth Co., Montreal, Q.—Floor oil cloths. 234
- 188 Woolen Manufacturing Co., Waterloo, Ont.—Tweeds. 235
- 189 Smith & Wilby, Toronto, Ont.—Samples of shoddy. 235
- 210 Taylor, R. F., & Son, Toronto, Ont.—Full dress suit, dress overcoat. 250
- 211 Simpson, Joseph, Toronto, Ont.—Hosiery. 250
- 212 McCraie & Co., Guelph, Ont.—Knit goods and hosiery. 250
- 213 Ancaster Knitting Co., Hamilton, Ont.—Knitted and fancy goods. 250
- 214 Blacklock, W., & Co., Hastings, Ont.—Wool shirts and drawers. 250
- 215 Smith, H. H., Goderich, Ont.—Suits of Canadian goods. 250
- 216 Shorey & Co., Montreal, Q.—Ready made clothing. 250
- 217 Watson & Baker, Montreal, Q.—Fox hunting suit. 250
- 218 Skelton, Tooke, & Co., Montreal, Q.—Shirts, collars, and cuffs. 250

Yarns and Woven Goods of Vegetable or Mineral Materials.

Clothing, Ornaments, Fancy Goods, Stationery.

- 219 Brown & Clagget, Montreal, Q.—
Dresses. 250
- 220 Willis, E., & Co., St. John, N. B.—
Paper collars and cuffs. 250
- 221 Sweeny, M., Bros., Moncton, N. B.—
—Ready made clothing. 250
- 222 Muir, J. N., St. John, N. B.—Ready
made clothing. 250
- 223 Manchester, Robertson, & Co., St.
John, N. B.—Shirts and collars. 250
- 224 McKenzie Bros., St. John, N. B.—
Regalias. 250
- 225 Saunders, B., Toronto, Ont.—
Clothing. 250
- 226 Taylor, John K., Carleton, N. B.—
Clothing. 250
- 227 Sillery Convent, Quebec, Q.
a Church vestments. 250
b Embroidery and lace. 252
- 228 Boot and Shoe Co., Sussex, N. B.—
—Boots and shoes. 251
- 229 Sutherland, A., Kingston, Ont.—
Boots and shoes. 251
- 230 Holmes, John, Toronto, Ont.—
Boots and shoes. 251
- 231 King & Brown, Toronto, Ont.—
Boots and shoes. 251
- 232 Pease, Jos., Toronto, Ont.—Boot
and shoe uppers. 251
- 233 Moore Th., Cooksville, Ont.—
Wood models of boots and shoes. 251
- 234 Brasier & Chadhand, Toronto, Ont.—
—Straw hats. 251
- 235 Corestine, J., & Co., Montreal, Q.—
Hats and caps. 251
- 236 Collyer, Fairbairn, & Co., Montreal,
Q.—Straw hats and bonnets. 251
- 237 Gentesse, C., Montreal, Q.—Im-
proved head conformateur. 251
- 238 Slater & Perry, Montreal, Q.—
Boots and shoes. 251
- 239 Cloutier, George, Pointe Levis, Q.—
—Shooting boots. 251
- 240 Bresse, G., Quebec, Q.—Boots and
shoes. 251
- 241 Convent of Good Shepherd, Q.
a Hat of ash wood. 251
b Lace. 252
c Ash and hair jewelry. 253
- 242 Woodley, J. A., Quebec, Q.—Boots
and shoes. 251
- 243 Boot and Shoe Factory, St. John,
N. B.—Boots and shoes. 251
- 244 Dominion Suspender Co., St. Ste-
phens, N. B.—Gents' and youths' suspend-
ers. 251
- 245 Magee, D., & Co., St. John, N. B.
a Hats and caps. 251
b Furs. 256
- 246 Taylor, Robert, Halifax, N. S.
a Boots and shoes. 251
b Trunks. 255
- 247 St. Joseph Convent, Levis, Q.—
Embroidery and lace. 252
- 248 Carrier, Miss L., Levis, Q.—Point
lace work. 252
- 249 Carrier, Miss H., Levis, Q.—Em-
broidered handkerchief, etc. 252
- 250 Jeffrey, F., Richmond, Q.—Point
lace parasol cover. 252
- 251 Perley, Miss H. A., Fredericton, N.
B.—Point lace. 252
- 252 Jardine, Miss, Richibucto, N. B.—
Point and net lace. 252
- 253 Sutcliffe, Miss E. W., Halifax, N.
S.—Needle work. 252
- 254 Fairbanks, Miss J., Halifax, N. S.—
—Fancy work. 252
- 255 Remain, Miss M., Halifax, N. S.—
Fancy work. 252
- 256 Bulleck, Miss M., Halifax, N. S.—
Fancy work. 252
- 257 Farrell, Misses L. & T.—Dart-
mouth, N. S.—Fancy work. 252
- 258 Morrison, W. C., Toronto, Ont.—
Society regalia and jewels, lapidary work,
Canadian stones, gold and silver work. 253
- 259 Hutchins, George, St. John, N. B.—
—Goldsmith work. 253
- 260 Saunders, S., Guelph, Ont.—Carved
walking canes. 254
- 261 Shantz, J. Y., Berlin, Ont.—Vege-
table ivory buttons. 254
- 262 Montreal Weaving Co., Montreal,
Q.—Stays and laces. 254
- 263 Lavoie, M., Montreal, Q.—Hair
work. 254
- 264 Leblanc, J. H., Montreal, Q.—
Fancy feathers. 254
- 265 Clarke, U. E., & Co., Toronto, Ont.—
—Trunks, valises, and bags. 255
- 266 Ellis, J. F., Toronto, Ont.—Pocket-
books, leather goods. 255
- 267 Barbridge, S. & H., Ottawa, Ont.—
Trunks. 255
- 268 Chisholm, W., New Glasgow, N.
S.—Ladies' trunks. 255
- 269 Renfrew, G. R., & Co., Quebec, Q.—
—Furs, Indian work. 256
- 270 Reynolds & Volkel, Montreal, Q.—
Complete set of furs. 256
- 271 Hudson Bay Co., Montreal, Q.—
Furs. 256
- 272 Keizer, C., & Son, Halifax, N. S.—
Furs. 256
- Paper, Blank Books, and Stationery.**
- 273 Dredge, A., & Co., Toronto, Ont.
a Stationery, pocketbooks, envelopes. 258
b Blank books. 261
- 274 Smart, James, Brockville, Ont.—
Copying presses. 258
- 275 McCready, G. W., Petit Codiac, N.
B.—Perpetual calendar. 258
- 276 Gibbs & Coursolle, Ottawa, Ont.—
Artificial parchment. 259
- 277 Barber, W., & Bros., Georgetown,
Ont.
a Envelopes, book paper. 259
b Printing, book, manila, and wrapping pa-
per. 260
c Wall paper. 264
- 278 Kilgoren Bros., Toronto, Ont.—
Paper bags. 260
- 279 Rairdon, John, Merriltown, Ont.—
Bags, printing and wrapping paper. 260
- 280 Gore Paper Mills, Dundas, Ont.—
Bag, brown, and straw wrapping pa-
per. 260
- 281 Dupont Manufacturing Co., Port-
neuf, Q.—Printing paper. 260

Paper, Weapons, Medical Appliances, Hardware.

- 282 Reid, J., & M., Quebec, Q.—Printing and wrapping paper, felt bags. 260
- 283 Wilson, J. C., & Co., Montreal, Q.—Paper bags. 260
- 284 Canada Paper Co., Montreal, Q.—Wrapping and printing paper and envelopes. 260
- 285 Nelson, C. L., St. John, N. B.—Paper bags. 260
- 286 Graves, V., Penobsquis, N. B.—Brown manila and printing paper. 260
- 287 St. Croix Paper Co., St. Croix, N. S.—Paper. 260
- 288 Warnick, Wm., Toronto, Ont.—School blank books, letter press. 261
- 289 Hunter, Rose, & Co., Toronto, Ont.—Books printed and bound. 261
- 290 Brown Bros., Toronto, Ont.—Account and pocket book binding. 261
- 291 Perrault, Ls., & Co., Montreal, Q.—Account books, printing. 261
- 292 Burland, Desbarats, & Co., Montreal, Q.—Book and job printing. 261
- 293 Dawson Bros., Montreal, Q.—Blank books, binding. 261
- 294 McMillan, J. & A., St. John, N. B.—Blank books, job printing. 261
- 295 MacKinlay, A. & W., Halifax, N. S.—Blank books. 261
- 296 Odell, O. S., St. John, N. B.—Paper boxes. 262
- 297 Stanton, M., & Co., Toronto, Ont.—Room paper hangings. 264
- 298 Bustin, Robert, St. John, N. B.—Paper pasting machine. 264

Weapons, etc.

- 299 Reif, John, Hamilton, Ont.—Model breechloading fieldpiece. 266
- 300 Meyer, F. W., Albert, Montreal, Q.—Small gun, light artillery. 266
- 301 Rambone, W. G., Toronto, Ont.—Implements for breech and muzzle guns. 269
- 302 Stephens, P. E., Owen Sound, Ont.—Breechloading rifle. 269
- 303 Kilby, R. H., Montreal, Q.—Evans repeating rifle. 269
- 304 Robertson, James, Montreal, Q.—Lead shot. 269
- 305 Egan, John, Halifax, N. S.—Case of guns and rifles. 269

Medicine, Surgery, Prothesis.

- 306 Victoria Manufacturing Co., Toronto, Ont.—Medicines. 272
- 307 Miller, Hugh, & Co., Toronto, Ont.—Tick destroyer for sheep. 272
- 308 Bond, John, Goderich, Ont.—Vegetable tonic bitters. 272
- 309 Painchaud, C. F., Varennes, Q.—Plasters. 272
- 310 Stewart, George, St. John, N. B.—Ships' medicine chest. 272
- 311 Carter, S. B. N., Halifax, N. S.—Ships' medicine chest. 272
- 312 Painchaud, C. F., Varennes, Q.—Plaster machine. 274
- 313 Chultre, Ch., Hamilton, Ont.—Surgical appliances. 276

- 314 Canada Truss Factory, Montreal, Q.—Surgical apparatus, artificial limbs. 276
- 315 Pourtier, M., Quebec, Q.—Philodonte fountain. 277

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 316 Moore, Th., Cooksville, Ont.—Axe and tool handles. 283
- 317 Harrigan, J., & Son, Dundas, Ont.—Axes. 280
- 318 Smith, R. H., & Co., St. Catherine, Ont.—Saws. 280
- 319 Warren, H. H., Bridgetown, Ont.—Hammers. 280
- 320 Dates Patent Steel Co., Toronto, Ont.—Edge tools. 280
- 321 Marshall & Oxford, Hamilton, Ont.—Bench fastener. 280
- 322 Ashevan & Walsh, Ottawa, Ont.—Lumberman tools. 280
- 323 Robertson, Peter, Ottawa, Ont.—Lumberman and stonecutters' tools. 280
- 324 Warnock, Jos., & Co., Galt, Ont.—Edge tools for wood, iron, and stone. 280
- 325 Booth, G., Toronto, Ont.—Engine and pipe wrench. 280
- 326 Emond, V. A., Quebec, Q.—Bench tools. 280
- 327 Chapleau, Godfroi, Montreal, Q.—Limestone cutters' tools. 280
- 328 Gilmour, G., Cote St. Paul, Q.—Augurs and bits. 280
- 329 Boivin & Co., New Liverpool, Q.—Axes and edge tools. 280
- 330 Robertson, James, Montreal, Q.—Saws. 280
- 331 Tremble, Jos., St. John, N. B.—Bench tools. 280
- 332 Spilur Bros., St. John, N. B.—Edge tools and cutlery. 280
- 333 Tyzich, James, St. John, N. B.—Saw grinder. 280
- 334 Morris, John, St. John, N. B.—Augers. 280
- 335 Brand, E., Milltown, N. B.—Axes, edge tools, hammers. 280
- 336 Brown, J., Fredericton, N. B.—Axes. 280
- 337 Risteen, J., Fredericton, N. B.—Edge tools. 280
- 338 Chipman Bros., Halifax, N. S.—Edge tools. 280
- 339 Morley, Victoria, Br. Col.—Carpenters' mallets, yew and arbutus. 280
- 340 Cable, Bayard, & Co., Montreal, Q.—Adjustable elastic razor strop. 281
- 341 Whelpley, J. Albert, Greenwich, N. B.—Skates. 281
- 342 Starr Manufacturing Co., Halifax, N. S.—Skates. 281
- 343 Fenerty, E. L., & Co., Halifax, N. S.—Skates. 281
- 344 Copp Brothers, Hamilton, Ont.—Enameled ware. 283
- 345 Ewitt, W. E., St. John, N. B.—Architecture and ornamental iron work. 283
- 346 Hagelhuirst & Co., St. John, N. B.—Architecture and ornamental iron work. 283

Hardware, Household Utensils, Vehicles.

- 347 Laidlaw, A., & Co., Hamilton, Ont.
a Enameled hollow ware. 283
b Enameled plumbers' ware. 284
- 348 Booth & Son, Toronto, Ont.—Copper work. 284
- 349 Dixon, Smith, & Co., Toronto, Ont.—Sash fastener. 284
- 350 Lalor, Thos., & Sons, Toronto, Ont.—Locking apparatus. 284
- 351 Griffith & Co., Toronto, Ont.—Locks. 284
- 352 Campbell, Geo., Toronto, Ont.—Fireproof shutters. 284
- 353 Gibbs, Geo., & Co., Porthope, Ont.—Nuts and bolts. 284
- 354 Law, John, London, Ont.—Brasswork, bells. 284
- 355 Griffith & Co., Toronto, Ont.—Lock and latches. 284
- 356 Brisley, W., Toronto, Ont.—Clip hook. 284
- 357 Fuller, Richard T., Toronto, Ont.—Sash fastener. 284
- 358 Stringer, Jos., Kingston, Ont.—Locks. 284
- 359 Cavern & Button, Gamaroque, Ont.—Hinges and nails. 284
- 360 Ritchie, John, & Son, Toronto, Ont.—Brasswork. 284
- 361 Smart, James, Brockville, Ont.—Building hardware. 284
- 362 Stacey, Geo., Montreal, Q.—Chisel-pointed nails. 284
- 363 Pillow, Hersey, & Co., Montreal, Q.—Tacks, nails, spikes, horseshoes. 284
- 364 Robertson, J., Montreal, Q.—Lead pipe. 284
- 365 Ives, H. R., Montreal, Q.—General hardware. 284
- 366 Holiwell, W. A., Quebec, Q.—Door pulley and sash regulator. 284
- 367 Weer, Jo., Monctar, N. B.—Machinist work. 284
- 368 Coldbrook Rolling Mills Co., St. John, N. B.—Cut and clinch nails, spikes, knees. 284
- 369 Cooil, E. R. N., & Co., St. John, N. B.—Nails, spikes, horseshoes. 284
- 370 Allan Brothers, St. John, N. B.—Ships' iron work, brass castings. 284
- 371 Meyers, S., & Son, St. John, N. B.—Machine screws. 284
- 372 Jonny, L. M., St. John, N. B.—Bolts, washers, screws, horseshoes. 284
- 373 Foster, S. R., & Son, St. John, N. B.—Tacks, nails. 284
- 374 Hilman, Wm., St. John, N. B.—Carriage and harness trimmings. 284
- 375 Harris, James, & Co., St. John, N. B.—Ships' iron knees, straps. 284
- 376 Starr Manufacturing Co., Halifax, N. S.—Nails, spikes, bolts, cans, dies. 284
- 377 N. W. Arm Rolling Mill Co., Halifax, N. S.—Kegs nails. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 378 Rubber Co., Quebec, Q.—Rubber shoes. 285

- 379 Grind, G. R., London, Ont.—Corn broom and wisks. 286
- 380 Morris, W. B., Ottawa, Ont.—Brushes. 286
- 381 Murphy, Simnes, & Co., St. John, N. B.—Brushes. 286
- 382 Whitehead & Turner, Quebec, Q.
a Brushes, brooms, dusters. 286
b Fancy woodenware. 289
- 383 Nelson, H. A., & Sons, Montreal, Q.—Brooms. 286
- 384 Copeland & McLaren, Montreal, Q.—Wire brushes. 286
- 385 Copland, McLaren, & Co., Montreal, Q.—Wire brushes for cleaning castings. 286
- 386 Boeck, C., Toronto, Ont.—Brushes. 286
- 387 Copeland, Geo., Hamilton, Ont.—Cordage and twine. 287
- 388 Brown, J., & Co., Quebec, Q.—Ropes. 287
- 389 Edward, W., St. John, N. B.—Mannilla cordages. 287
- 390 Conner, Thos., & Sons, St. John, N. B.—Cords, ties, lines. 287
- 391 Dartmouth Rope Work Co., Halifax, N. S.—Ropes. 287
- 392 Andi Bridge, West Brook, Ont.—Pails and tubs. 289
- 393 Canada Car Co., Toronto, Ont.—Household woodenware. 289
- 394 Hall, G. B., Quebec, Q.—Tubs, pails. 289
- 395 Boyce, J. R., Montreal, Q.—Toys, willow work. 289
- 396 Peacock, W., Montreal, Q.—Crick-et bats. 289
- 397 Convent of Good Shepherd, Quebec, Q.—Ash basketware. 289
- 398 Rice, W. H., Toronto, Ont.—Galvanized wire work. 291
- 399 Wendberg & Co., Toronto, Ont.—Galvanized ironwork. 291

Carriages, Vehicles, and Accessories.

- 400 Thompson & Young, Listowel, Ont.—Phaeton buggy. 292
- 401 Vinos & Rothwell, Goderich, Ont.—Single open buggy. 292
- 402 Lyon, Woods, Brantford, Ont.—Buggies. 299
- 403 Dixon, W., Toronto, Ont.—Carriages. 299
- 404 Morgan, Malloy, & Malcolm, Hamilton, Ont.—Phaeton. 292
- 405 Pronfung, J. P., Hamilton, Ont.—Landau, phaeton, buggy. 292
- 406 Nash & Jackson, London, Ont.—Double carriage. 292
- 407 Campbell, John, London, Ont.—Carriages. 292
- 408 Ashley, Chas., London, Ont.—Top phaeton. 292
- 409 Kew, Wm., & Son, Bramsville, Ont.
a Covered buggy. 292
b Dog sleigh. 295
- 410 Hamill, W. J., St. Catherine Ont.
a Trotting sulky. 292
b Trotting sleigh. 295

Vehicles, Saddlery, and Appliances.

- 411 Armstrong, J. B., Guelph, Ont.
a Phaeton carriage. 292
b Single sleigh, dog-cart sleigh. 295
c Cast steel springs for carriages. 296
- 412 Gray, W., Chatham, Ont.—Open and covered buggies. 292
- 413 Ledoux, B., Montreal, Q.
a Double half landau. 292
b Double sleigh. 295
- 414 Legaré, J. B., Quebec, Q.
a Carriages. 292
b Sleighs. 295
- 415 Kelly Bros. & Co., St. John, N. B.—Open and top buggies. 292
- 416 Cooper & Campbell, Fredericton, N. B.—Carriage. 292
- 417 McFarlane, Peter, Douglass, N. B.—Carriage. 292
- 418 De Wolfe, John M., Halifax, N. S.—Pony carriage, phaeton, T cart, miniature brougham or coupé. 292
- 419 Guerin, C., Ottawa, Ont.—Child's carriage. 293
- 420 Crothers & Wilson, St. John, N. B.—Sulky, wagon. 293
- 421 Dibel, H., Tavistock, Ont.—Road wagon. 294
- 422 Vinos & Rothwell, Goderich, Ont.—Cutter. 295
- 423 Ashley, Chas., Foxboro, Ont.—Portland sleigh. 295
- 424 Carboy, Daniel, Uxbridge, Ont.—Single cutter. 295
- 425 Vessot, J. & S., Joliette, Q.—Wheel runner. 295
- 426 Webb, John R., Quebec, Q.—Sliding sleigh. 295
- 427 Edgecomb, John, & Son, Fredericton, N. B.—Single and double sleighs. 295
- 428 Mussen, Jas., St. John, N. B.—Tobogan. 295
- 429 Currie & McVean, Hamilton, Ont.—Hubs, spokes, bent woods. 296
- 430 Hunt, Cairns, & Co., St. Catherine, Ont.—Wheels, spokes, felloes, hubs. 296
- 431 Lugsden & Barnett, Toronto, Ont.—Ladies' hunting saddles. 296
- 432 Skellington, S., Bros., Windsor, Ont.—Whip lashes. 296
- 433 Barbridge, S. & H., Ottawa, Ont.—Harness. 296
- 434 Vahey, W., Forrest, Ont.—Collars and machine. 296
- 435 Pelt, J. & J., Hamilton, Ont.—Mats and robes for carriages. 296
- 436 Kent, F., Hamilton, Ont.—Tie fastener. 296
- 437 Smith, Alex., London, Ont.—Fifth wheels, darm frames, loops. 296
- 438 Percy, John, Bowmanville, Ont.—Horseshoes. 296
- 439 Weichel, M., Elmira, Ont.—Horseshoes. 296
- 440 Bell, C. R., Parkhill, Ontario.—Horseshoes. 296
- 441 Malcolm, R., Toronto, Ont.—Saddlery, harness, bags. 296
- 442 Cable, Bayard, & Co., Montreal, Q.—Halter clasps. 296
- 443 Payette, Adolphe, Montreal, Q.—Axle. 296
- 444 McFarlane, Peter, & Son, Douglass, N. B.—Hubs, spokes, wheels. 296
- 445 Sellwinn, Henry, Listowell, Ont.—Single harness. 296
- 446 Culbeck, W. H., Sussex, N. B.—Harness, collars. 296
- 447 McFarlane, Walter, St. Marys, N. B.—Harness. 296
- 448 Morren & Robb, St. John, N. B.—Harness, saddles, bridles. 296
- 449 Campbell & Fowler, St. John, N. B.—Springs and axles. 296
- 450 Fenerty, E. F., & Co., Halifax, N. S.—Carriage axles. 296
- 451 Clark, T. L., Montreal, Q.—Nickel-plated goods. 296
- 452 Holwell, W. A., Quebec, Q.—Safety rein. 296



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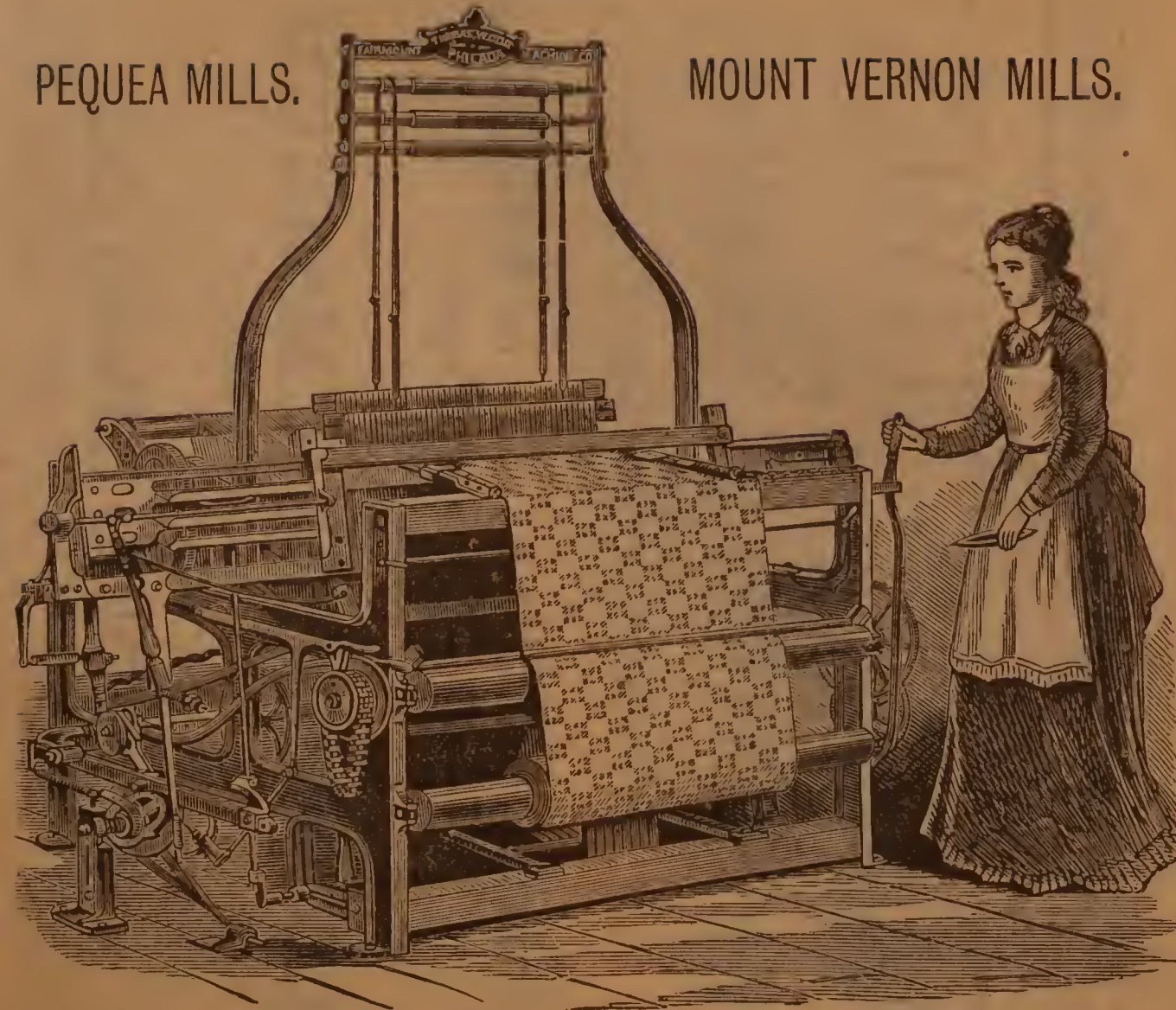
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Chemical Manufactures.

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- 2 Coignet, Father & Son, & Co., Paris.—Chemical and pasture products. 200
- 3 Galzy, E., Lyons.—Insect products. 200
- 4 Fournier, Jean, Roanne, Loire.—Cream of tartar. 200
- 5 Hygienic Products Manufacturing Co., Paris.—Chemical preparations. 200
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- 7 Limousin & Co., Paris.—Medicated capsules. 200
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- 15 Brasseur, Romorantin, Loir and Cher.—Pectoral tonic syrup. 200
- 16 Bravais, Rooul, & Co., Paris.—Pharmaceutical preparations. 200
- 17 Chevrier, Paris.—Pharmaceutical preparations. 200
- 18 Cléry, Hughes, Paris.—Pharmaceutical preparations. 200
- 19 Vicat, Joseph Henri, Paris.
 - a Insect powder, and instruments for its use. 200
 - b Liquid blacking. 202
- 20 Tancrede Bros., Paris.—Glue and gelatine, animal charcoal, bone tallow. 200
- 21 Daubin & Co., Paris.—Fly-paper and mosquito powder. 200
- 22 Druelle, Reims, Marne.—Champagne wines. 200
- 23 Dubois, Charles, Marseilles.—Special chemical preparations for the navy. 200
- 24 Garnier, P., Noyon, Oise.—Pharmaceutical preparations. 200
- 25 Ducro & Co., Paris.—Meat extract. 200
- 26 Jacquand, Father & Son, Lyons.—Glues, gelatines, bone phosphates, etc. 200
- 27 Joseph, Victor, Petit Quévilly, near Rouen.—Oil for burns. 200
- 28 Lefebvre, Fortuné, Illiers, Eure and Loire.—Green water. 200
- 29 Reynal, Léonce, Paris.—Pharmaceutical preparations. 200
- 30 Rigand & Dusard, Paris.—Chemical and pharmaceutic preparations. 200
- 31 Rubaton, Ges., & Co., Marseilles.—Carbonate of soda. 200
- 32 Solvay & Co., Varangeville, Dombasle, Meurthe and Moselle.—Chemical products. 200
- 33 Torchon, Ch., Paris.—Pharmaceutical preparations. 200
- 34 Hottot, A., & Co., Paris.—Pepsin and other digestive preparations. 200
- 35 Thomas Brothers, Avignon, Vaucluse.
 - a Chemical products; artificial alizarine, sulphuric acid, etc. 200
 - b Madders. 202
- 36 Coux Roseaux, Asnieres, near Paris.—Oils and greases; covering for steam pipes. 201
- 37 Poiret & Son, Paris.—Soap in the form of letters and various ornaments. 201
- 38 Bourgeois & Co., Paris.—Machine oils. 201
- 39 Jolivet, L., Paris.—Wax tapers. 201
- 40 Deutsch, A., Paris.—Machine oils; refined petroleum. 201
- 41 Chivot, Naudé, Aimens, Somme.—Machine oils. 201
- 42 Roux, Charles, jr., Marseilles.—Soaps and raw materials; olive oil for dyers. 201
- 43 Rigaud & Co., Paris.
 - a Toilet soaps. 201
 - b Perfumery. 203
- 44 Violet, Godefroy, & Co., Paris.
 - a Soaps. 201
 - b Fine perfumery and raw materials. 203
- 45 Richter, F., Lille, Nord.—Ultramarine blue. 202
- 46 Berthoud & Co., Paris.—Blackening. 202
- 47 Antoine's, L., Son, Paris.—Writing inks. 202
- 48 Chiroux, L., Cambray.—Blackening. 202
- 49 Clauseau, Father & Son, Palun & Co., Avignon, Vaucluse.—Madder extract. 202
- 50 Coez, E., & Co., St. Denis.—Paints and varnishes. 202
- 51 Julien, A., & Co., Marseilles.—Chemical products, submarine paint. 202
- 52 Bourgeois, sr., Paris.—Fine colors for painting and drawing. 202
- 53 Caron, L., Paris.—Cement and plaster dryer. 202

Chemical Manufactures, Ceramics, Glass, Furniture.

- 54 Guinon's Son & Co., Lyons.—Chemical products for dyeing and printing. 202
- 55 Gillet & Son, Lyons.—Chemical products for dyeing. 202
- 56 Guimet, Lyons.—Ultramarine blue. 202
- 57 Hardy, Milori, Ch. G., Paris.—Colors. 202
- 58 Jacquot & Co., Paris.—Blacking. 202
- 59 Kaulek, Adolphe, Puteaux, Seine.—Coloring materials. 202
- 60 Larenaudière, F., Paris.—Inks. 202
- 61 Lacroix, A., Paris.—Vitrifiable colors for china, faience, church windows, opal, and enamel. 202
- 62 Lorilleux, Ch., Paris.—Black and colored typographic and lithographic inks. 202
- 63 Plateau, E., Paris.—Writing inks. 202
- 64 Poirrier, A., Paris.—Chemical products, coloring materials. 202
- 65 Seurin, J., Paris.—Varnish, mastic, and oil colors. 202
- 66 Toiray, Maurin, Paris.—Writing inks. 202
- 67 Foubert, A., Paris.—Hair dyes. 202
- 68 Brochocki, C. D., & Co., Boulogne, Seine.—Javelle water. 203
- 69 Chiris, A., Grasse, Alpes Maritimes.—Perfumery and raw materials. 203
- 70 Colas, E., & Christoff, C., Paris.—Essence of roses. 203
- 71 Delettrez, Adolphe, Paris.—Perfumery. 203
- 72 Hermann, Louis, Paris.—Raw materials for perfumery. 203
- 73 Lautier's Son, Grasse, Alpes Maritimes.—Raw materials for perfumery. 203
- 74 Mottett, J., & Co., Marseilles.—Raw materials for perfumery. 203
- 75 Roure, Bertrand, Son, Grasse, Alpes Maritimes.—Raw materials for perfumery; extracts and essences. 203
- 76 Seguin, Bordeaux.—Zenobia water and dyes. 203
- 77 Sensfelder, Arcueil, Seine.—Eye water and pomades. 203
- 78 Viard, F., Paris.—Perfumery. 203
- 79 Viguiet, Manager French Hygienic Society, Paris.—Figaro water. 203
- 80 Séguin, Paris.—Althocinum. 203
- 81 Roure, Bertrand, jr., Grasse, Alpes Maritimes.—Perfumery, extracts, and essences; raw materials. 203
- 82 Gevelot, Paris.—Ammunition for hunting and war. 204
- 88 Trichaud, A., Marseilles.—Tiles. 208
- 89 Boulenger, senior, Paris.—Incrusted mosaic pavement. 208
- 90 Gien Pottery, Gien (Loiret).—Artistic faience. 210
- 91 Caille, Miss Fanny, Paris.—Artistic faience. 210
- 92 Montagnon, A., Nevers.—Artistic faience. 210
- 93 Howry, J., Paris.—Artistic china and faience, fancy furniture. 210
- 94 Hasslauer & de Champeaux, Givet (Ardennes).—Clay pipes. 210
- 95 Aubry, J., Bellevue (near Toul).—Artistic faience. 210
- 96 Fiolet, L., St. Omer (Pas de Calais).—Clay pipes. 210
- 97 Brianchon, J., senior, Paris.
a Artistic faience. 210
b Pearl porcelain. 213
- 98 Sergent, Th., Paris.—Artistic faience. 211
- 99 Barbizet, Son, Paris.—Bernard Pallissy faience. 211
- 100 Sohn, L., & Delabre, A., Paris.—Porcelain flowers, jewels, ornaments, crowns, and bouquets. 212
- 101 Woodcock, F., Paris.—Porcelain flowers and bouquet. 212
- 102 Blot, Paul, Paris.—China and glass. 213
- 103 Détemmerman, P., Paris.—Porcelain flowers. 213
- 104 Vacquerel, P. E., Paris.—Decalcomania on porcelain. 213
- 105 Thierry, Paris.—Decorated china. 213
- 106 Field, Haviland Ch., Paris.—Porcelain. 213
- 107 Hache, Ad., & Lehalleur Bros., Paris.—White and decorated porcelain. 213
- 108 Haviland & Co., Limoges.—China. 213
- 109 Floreffe Company, Jeumont (Nord).—Mirrors and glassware. 214
- 110 St. Gobain, Chauny, & Cirey, Paris.—Plain, plated, and silvered glass; rough glass for skylights. 214
- 111 Pelletier, M. A., & Sons, St. Just on the Loire.—Stained window glass. 214
- 112 Appert, Lengele, & Co., Paris.—Glass cylinders. 216
- 113 Brocard, P. J., Paris.—Chandeliers and mirrors. 216
- 114 Souchet & Co., Paris.—Flowers in enamel. 216
- 115 Hue & Co., Paris.—Crystals for interior decorations. 216
- Ceramics—Pottery, Porcelain, Glass, etc.
- 84 Goyard, F., Paris.—Crucibles and furnaces for laboratories. 207
- 85 Simons & Co., Cateau (Nord).—Mosaic tiles of sandstone in vestibule of Department of Public Works Pavilion. 208
- 86 Muller, E., & Co., Ivry (Seine).—Enameled tiles in the vestibule and on the front of Department of Public Works Pavilion. 208
- 87 Ollive, A., Paris.—Faience pavements. 208
- Furniture and Objects of General Use in Construction and in Dwellings.
- 116 Raffl & Co., Paris.—Church statues and furniture. 217
- 117 Poussielgue, Rusand P., Paris.—Church decorations. 217
- 118 Perrot, Henry, Paris.—Bronzes for furniture. 217
- 119 Parfonry & Lemaire, Paris.—Marble chimney pieces. 217

Furniture, Ornaments, Household, Heating, and Lighting Appliances.

- 120 Touchard, Ernest, Paris.—Special ornaments for churches. 217
- 121 Duplan, Hamot, & Co., Paris.—Furniture. 217
- 122 Brunet, Paul, Paris.—Bronze and goldsmiths' wares for churches. 217
- 123 Morel, A., Paris.—Bronzes for furniture. 217
- 124 Michel, Louis, Toulouse.—Church decorations. 217
- 125 Mazaroz, Ribalier, Paris.—Artistic furniture. 217
- 126 Marga, Eugene, Paris.—Marble chimney piece. 217
- 127 Mayaud Bros., Paris.—Religious articles. 217
- 128 Marchand, I., Paris.—Decorated furniture. 217
- 129 Marchand, Louis-Léon, Paris.—Artistic bronzes for furniture. 217
- 130 Lichtenfelder, Paris.—Elastic steel seats. 217
- 131 Haffner, B., senior, Paris.—Safes with combination locks. 217
- 132 Kaffel Bros., Paris.—Bronze furniture with china, faience, crystal, and marble decorations. 217
- 133 Jolivet, L., Paris.—Candles for churches. 217
- 134 Houry, T., Paris.—Fancy furniture. 217
- 135 Gallais, A., Paris.—Lacquered furniture. 217
- 136 Froc, Robert, & Son, Paris.—Altars and religious statues. 217
- 137 Eliaers, A. E., Paris.—Folding seats. 217
- 138 Cornu, E., & Co., Paris.—Bronzes. 217
- 139 Chovet, L., Paris.—Religious pictures. 217
- 140 Beysens & Beckers, Paris.—Religious articles. 217
- 141 Susse Brothers, Paris.—Bronzes. 217
- 142 Sussfeld, Lorsch, & Co., Paris.—Marble clocks. 217
- 143 Sauvage & Ruck, Paris.—Bronze mantel ornaments. 217
- 144 Frenais, Armand, Paris.—Unplated and plated knives, forks, and spoons. 218
- 145 Bitterlin, Paul, jr., Paris.—Glassware. 218
- 146 Gien Pottery Manufacturing Co., Gien (Loiret).—Artistic faience. 218
- 147 Haviland & Co., Limoges.—Table china. 218
- 148 Field-Haviland, Ch., Paris.—Table china. 218
- 149 Hache, Ad., & Pepin, Lehalleur Bros., Paris.—Table china. 218
- 150 Bitterlin, Son, Paris.—Glassware. 218
- 151 Blot, Paul, Paris.—Table glass and china ware. 218
- 152 Lorin, A., Chartres (Eure and Loir).—Stained glass church windows. 219
- 153 Brocard, P. T., Paris.—Enameled glass. 219
- 154 Floreffé Company, Jeumont (Nord).—Mirrors. 219
- 155 Chabin, H., Paris.—Stained glass windows. 219
- 156 St. Gobain, Chauny, & Cirey, Paris.—Mirrors. 219
- 157 Mansuy-Dotin, Jules, Paris.—Artistic enamels for furniture. 219
- 158 Pelletier, M. A., & Sons, St. Just sur Loire.—Stained window glass. 219
- 159 Pottier, Paris.—Artistic enamels, Limousin and Henry II style. 219
- 160 Thiry, jr., Paris.
a Galvanized iron bird cage. 219
b Forged iron pavilion. 227
- 161 Luttringer, Ch., Paris.—Pasteboard frames. 220
- 162 Neuville, J. B., Paris.—Heating apparatus. 222
- 163 Laperche, Paris.—Marble chimney pieces. 222
- 164 Aubry, T., Bellevue, near Toul.—Faience stoves. 222
- 165 Entz, H., Wazcon, near Sedan.—Portable cooking range used in the army. 222
- 166 Roux, L., Lyons.—Heaters and chimney pieces. 222
- 167 Robinot, Ch., Paris.—Gas fixtures. 223
- 168 Corbon, Paris.—Lamps. 223
- 169 Peltier, E., & Paillard, A., Paris.—Metallic labels and boxes for preserves; direct printing upon metals. 224
- 170 Barau & Colas, Nantes (à la Ville en Bois).—Metallic jars for preserving. 224
- 171 Mestre, A., de Bordeaux.—Apparatus for corking gaseous liquids. 224
- 172 Letang, Th. I. B., Paris.—Chocolate moulds. 224
- 173 Gervais, A., & Co., Paris.—Kettles. 224
- 174 Fisse, Thirion, & Co., Reims.—Iron clasps; system of corking wines. 224
- 175 Denet, E., Paris.—Copper moulds for alimentary pastes. 224
- 176 Dagand, Etienne, Paris.—Coffee pots used by the army, navy, steamships, and public establishments; hot water baths. 224
- 177 Dienheim-Brochocki, T. O. de, Paris.—Automatic disinfectors. 226
- 178 Chappée, A., Mans (Sarthe).—Iron water and gas pipes. 227
- 179 Richard, B., Longecourt, near Aisery (Cote d'or).—Massive floor with borders. 227
- 180 Regnier, Paris.—Economical wooden ridge of a house. 227
- 181 Bonhomme, Uncle and Nephew, Paris.—Wooden doors of the vestibule, and wainscoting and frames, of the drawings of the Department of Public Works Pavilion. 227
- 182 Moisant, A., Paris.—Metallic frame of Department of Public Works Exhibition Pavilion. 227
- 183 Secretan, E., Paris.—Copper sheets for construction. 227

Woven and Felted Goods, Silks.

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 184 Pallu, Eug., & Co., Mahé (Ile Seychelle).—Cocoanut fibres. 229
- 185 Dumortier & Cuignet, Roubain (Nord).—Tickings. 230
- 186 Cartier-Bresson, Paris.—Cotton threads. 230
- 187 Perreaux, L. G., Paris.—Model of a military tent. 230
- 188 Walcker, W., Paris.—Military and garden tents. 230
- 189 Chiffray, A., Maronne, near Rouen.
a Printings. 230
b Calicoes. 232
- 190 Roussel, Emile, Roubaix (Nord).—Dyed and printed cotton fabrics. 232
- 191 Vraux & Co., Paris.—Linen thread. 233
- 192 Meunier & Co., Paris.—Linen and linen table covers. 233
- 193 Hassebroucq Brothers, Comines (Nord).—Linen threads. 233
- 194 Vrau & Co., Lille.—Hemp thread for sewing. 233

Woven and Felted Goods of Wool, etc.

- 195 Demar, L., Elbeuf (Seine Inférieure).—Gentlemen's dress goods. 235
- 196 Dumortier & Cuignet, Roubaix (Nord).—Cloth. 235
- 197 Prouvost, Amédée, & Co., Roubaix.—Carded wools. 235
- 198 Chamber of Commerce, Reims.—Woolen fabrics. 235
- 199 Delamotte-Mongrenier, Reims (Marne).—Dyed merinoes, cashmeres, reps, etc. 235
- 200 Seydoux, Sieber, & Co., Paris.—Carded threads and woolen fabrics. 235
- 201 Talamon, Son, & Co., Paris.—Woolen fabrics. 235
- 202 Bellest, E., & Co., Elbeuf.—Woolen cloth. 235
- 203 Blin & Bloch, Elbeuf (Seine Inférieure).—Woolen cloth. 235
- 204 De caux Son, Elbeuf.—Woolen cloth. 235
- 205 Dabert & Co., Saint Denis (Seine).—Dyed woolen fabrics. 235
- 206 Fortin Bros., Paris.—Felts. 235
- 207 Fouchet, sr., & jr., & Hulme, Elbeuf.—Cloth. 235
- 208 Frézon, sr., & Leclerc, sr., Amiens.—Cloth. 235
- 209 Philippe, C., Elbeuf (Seine Inférieure).—Cloth for pants and vests. 235
- 210 Mali, Henry W. T., & Co., Paris.—Woolen fabrics and cloth. 235
- 211 Pinon & Guérin, Paris.
a Cloth for men's wear. 235
b Novelties for females' wear. 238
- 212 Reynaud, Paris.—Medicated flannel. 236
- 213 Terrillon, L., Paris.—Shawls. 237
- 214 Robert, Guérin, Widow, & Son, Reims (Marne).—Merinoes and Scotch cashmeres. 238

- 215 Houpin, Ernest, Reims (Marne).—Dyed merinoes, cashmeres, reps, etc. 238
- 216 Maes, G., Clichy-la-Garonne.—Dyed woolen fabrics. 238
- 217 Dufourmantel, Ph., & Co., Corbie (Somme).—Woolen and silk warps. 238
- 218 Chalamel, Alf., & Co., Paris.—Dyed woolen fabrics. 238
- 219 Laroche, A., Saulxures (Vosges).—Cotton and wool, with process of manufacture. 238
- 220 Drogue & Monnard, Lyons.—Poplins. 238
- 221 Droz, Juillet, & Co., Lyons.
a Poplins. 238
b Silks. 245
- 222 Gravier, Clément, Nimes (Gard).—Velvet carpets. 239
- 223 Duplan, Hamot, & Co., Paris.—Carpets. 239
- 224 Bertrand, Boulla, Nimes (Gard).—Imitations of old tapestries. 239
- 225 Braquenie Brothers, Paris.—Tapestries and carpets. 239
- 226 Grison, T., & Co., Lisieux (Calvados).—Dyed and printed cloth. 241
- 227 Guillaumet, A., Sons, Suresnes (Seine).—Dyed woolen fabrics. 241
- 228 Boquet, J., & Co., Amiens.—Velvet. 241
- 229 Chiffray, A., Maromme, near Rouen.—Printed woolen fabrics. 241
- 230 Roussel, Emile, Roubaix (Nord).—Dyed and printed woolen fabrics. 241
- 231 Piquée, F., & Bros., Paris.—Reps and velvets. 241
- 232 Poirrier-Mortier & Muller, Paris.—Dyed fabrics. 241
- 233 Vanoutryve, F., & Co., Paris.—Furniture coverings. 241
- 234 Wattine, Ch., & Co., Roubaix (Nord).—Furniture coverings and draperies. 241
- 235 Montagnac, E. de, & Son, Sedan (Ardennes).—Velvet. 241
- 236 Dupont, L., Paris.—Furniture coverings. 241

Silk and Silk Fabrics.

- 237 Pellet, A. P., St. Jean du Gard (Gard).—Raw silk. 242
- 238 Arles, Dufour, Lyons.—Raw silk. 242
- 239 Boudon, Louis, St. Jean du Gard.—Raw silk. 242
- 240 Chabert, J., & Co., Chomerac (Ardèche).
a Raw silk. 242
b Woven silks. 245
- 241 Thomas Brothers, Avignon (Vaucluse).
a Raw silk. 242
b Silks. 245
- 242 Thomas, F., Pont-des-Charrettes (Gard).
a Cocoons and raw silk. 242
b Silks. 245
- 243 Bonnet & Co., Lyons.
a Raw silk. 242
b Failles, taffetas, and satins. 245

Silks, Clothing.

- 244 Chardin, Ernest, Paris.—Sewing and embroidery silks. 243
- 245 Hamelin, A., Son., Paris.—Silks. 244
- 246 Faye & Thévenin, Lyons.—Colored silks. 243
- 247 Gascou, L. R., Montauban (Tarn and Garonne).—Bolting silk. 245
- 248 Gillett & Son, Lyons.—Black silks. 245
- 249 Giraud, Alex., & Co., Lyons.—Colored silks and foulards. 245
- 250 Trapadoux, A. L., Bros., & Co., Lyons.—Foulards. 245
- 251 Poncet, senior and junior, Lyons.—Silks. 245
- 252 Sévène, Barral, & Co., Lyons.—Failles. 245
- 253 Tapissier Sons & Debry, Lyons.—Black silks, failles, and taffeties. 245
- 254 Doux, E., & Co., Lyons.—Silks. 245
- 255 Mauvernay & Co., Lyons.—Silks. 245
- 256 Lachard Bros. & Co., Lyons.—Lining silks. 245
- 257 Jaubert, Audras, & Co., Lyons.—Black silks. 245
- 258 Jaudin & Duval, Lyons.—Foulards. 245
- 259 Brosset-Heckel & Co., Lyons.—Satins. 245
- 260 Audibert, Monin, & Co., Lyons.—Silks and poplins. 245
- 261 Bardon & Ritton, Lyons.—Colored silks. 245
- 262 Bullot, C., Paris.—Millinery goods. 245
- 263 Huber, E., & Co., Paris.—Silk plush for hatters. 245
- 264 Tabard, Benoit, & Co., Lyons.
a Silks and failles. 245
b Moire antiques. 246
- 265 Bressen-Agnès & Co., Lyons.
a Silks. 245
b Gauzes. 247
- 266 Guinet, Ant., & Co., Lyons.
a Black silks. 245
b Velvets. 247
- 267 Jurie, A., & Co., Lyons.
a Silks. 245
b Velvets. 247
- 268 Gondard, Cirlot, & Martel, Lyons.
a Foulards. 245
b Velvets. 247
- 269 Martin, J. B., Tarare (Rhône).
a Silks. 245
b Plush and velvets. 247
- 270 Million & Servier, Lyons.
a Silks. 245
b Velvets. 247
- 271 Champromy, J. B., Renaison (Loire).
a Foulards. 245
b Ribbons. 248
- 272 Gourd, Croizat, Son, & Dubost, Lyons.—Silks. 246
- 273 Henry, J. A., Lyons.—Silk fabrics for church ornaments and furniture. 246
- 274 Luthringer, Lyons.—Figured Silks. 246

- 275 Tassinari & Chatel, Lyons.—Silks for church ornaments and furniture. 246
- 276 Chiffray, A., Maromme, near Rouen.—Printing upon silk. 246
- 277 Servant, C. J., & Co., Lyons.—Black velvets. 247
- 278 Montessuy & Chomer, Lyons.—Crapes. 247
- 279 Terrillon, L., Paris.—Fancy goods and handkerchiefs. 247
- 280 Villard & Co., Lyons.—Black velvets. 247
- 281 Bouchinet, Paris.—Dress goods. 247
- 282 Gautier, Bellon, & Co., Lyons.—Velvets. 247
- 283 Dornon, L., Lyons.—Silk gauzes for bolting flour, and sifting chemical and ceramic products. 247
- 284 Font, Chambeyron, & Benoit, Lyons.—Black velvets. 247
- 285 David, J. B., Saint-Etienne (Loire).—Ribbons. 248
- 286 Girou Brothers, St. Etienne (Loire).—Velvet ribbons. 248
- 287 Lamary, Paris.—Silk watch guards. 249

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 288 Lutton, Am., Paris.—Chasubles. 250
- 289 Fromage, Lucien, & Co., Rouen.—Braces, belts, garters, and elastic tissues. 250
- 290 Tabourot & Pacault, Paris.—Shirts. 250
- 291 Vessiere-Paulin, J. A., Paris.—Children's clothing. 250
- 292 Vauthier, Mrs., Paris.—Children's clothing. 250
- 293 Tailors' Society, Paris.—Gentlemen's clothing. 250
- 294 Bullot, C., Paris.—Silk stockings. 250
- 295 Levilion, Paris.—Ladies' costumes and trimmings. 250
- 296 Lenoir, P., Paris.—Corsets. 250
- 297 Fouet, Mrs., Paris.—Ladies' underwear. 250
- 298 Farcy & Oppenheim, Paris.—Corsets. 250
- 299 Society of United Cutters, Paris.—Gentlemen's furnishing goods. 250
- 300 Vasseur, Mrs. Virginie, Paris.
a Traveling and court dresses; cloaks. 250
b Laces. 252
- 301 Herth, Henry, Paris.—Boots and shoes. 251
- 302 Jouvin & Co., Paris.—Kid gloves. 251
- 303 Tréfousse & Co., Chaumont (Haute-Marne).—Kid gloves. 251
- 304 Poron Bros., Troyes (Aube).—Millinery. 251
- 305 Jouvin, Mrs. Xavier, Paris.—Kid gloves. 251
- 306 Jeandron-Ferry, Paris.—Ladies' boots and shoes. 251
- 307 Jugla, D., Paris.—Kid gloves. 251

Clothing, Jewelry, Fancy Articles.

- 308 Mèliès, Louis Stanislas, Paris.—Boots and shoes. 251
- 309 Nemoz, Pierre, Paris.—Ladies' and children's felt hats. 251
- 310 Ruffin, J. B., Paris.—Hats for ladies and children. 251
- 311 Berr, Eugène, Paris.—Kid gloves. 251
- 312 Bullot, C., Paris.—Millinery. 251
- 313 Buscarlet, Widow, & Malo, Paris.—Kid gloves and skins. 251
- 314 Shoemakers' Society, Paris.—Boots and shoes. 251
- 315 Chapsal, Auguste, Aurillac (Cantal).—Waterproof shoes. 251
- 316 Dubois, Gustave, Mony (Oise).—Boots and shoes. 251
- 317 Corady, Julia de, Paris.—Millinery. 251
- 318 Pinet, F., Paris.—Boots and shoes for ladies and children. 251
- 319 Huard, L., Paris.—Boots and shoes. 251
- 320 Hegle, Glandines, & Corbeau, Paris.—Kid gloves. 251
- 321 Bacquet & Co., Saint-Pierre-les-Calais.—Machine-made laces. 252
- 322 Babey, Ch., Calais.—Tulles and embroideries. 252
- 323 Bailey, Alfred, Paris.—Tulles and gimp for furniture. 252
- 324 Boutenjeun, Saint-Pierre-les-Calais.—Machine-made laces. 252
- 325 Guibert, jr., Paris.—Gloves. 251
- 326 Maxton, Robert, & Co., Saint-Pierre-les-Calais.—Machine-made laces. 252
- 327 Meunier & Co., Paris.—Embroidered curtains. 252
- 328 Millas, Toulouse.—Gimps for furniture. 252
- 329 Herbelot & Devaux, Calais.—Blonde and laces. 252
- 330 Dieutegard, E. & E., Paris.—Trimmings. 252
- 331 Dognin & Co., Paris.—Lama, India, and Chantilly laces. 252
- 332 Giraud & Josserand, Tarare (Rhône).—Muslins and tarlatans. 252
- 333 Gaillard, J., Senior and Junior, Saint-Pierre-les-Calais.—Machine-made laces. 252
- 334 Frances Brothers, Saint-Pierre-les-Calais.—Tulle and blonde laces. 252
- 335 Flauraud & Son.—Laces. 252
- 336 Pauw, F. de, Paris.—Trimmings. 252
- 337 Perrin Brothers, Grenoble.—Kid gloves. 252
- 338 Raffin, Mrs. C. M., & Son, Tarare.—Tarlatans and muslins. 252
- 339 Terrillon, L., Paris.—Ladies' trimmings. 252
- 339 *a* Crassier & Co., Paris.—Laces. 252
- 340 Cossard, Paris.—Laces. 252
- 341 Cazin & Noyon, Saint-Pierre-les-Calais.—Blonde and black laces. 252
- 342 Verdé-Delisle & Co. (India Company), Paris.—Hand-made lace. 252
- 343 Davenière, E., jr., Saint-Pierre-les-Calais.—Machine-made laces. 252
- 344 Collective Exhibit of the Calvados lace manufacturers.—Dalechamp, J., Caen; Lecornu, Caen; Lecoq-Lamotte, Caen; Leroy, Mrs., Caen; Mèrouze, Mrs., Caen; Robert Bros., Courseulles-sur-Mer (Calvados); Mèrouze, U., Caen; Verdé-Delisle & Co., Caen. Laces. 252
- 345 Clément & Co., Paris.—Pearls and diamonds. 253
- 346 Audy, Mrs., Paris.—Imitation pearls. 253
- 347 Bolzani, Jean, Son, Paris.—Chains. 253
- 348 Bourcier, Ch., Paris.—Imitation jewelry. 253
- 349 Carbonneaux, Francois, Paris.—Gilt and steel jewelry. 253
- 350 Capra, J., Paris.—Gilt jewelry. 253
- 351 Foruch, A., Bourg (Ain).—Jewelry. 253
- 352 Hémery, Ed., Paris.—Gilt and gold-plated jewelry. 253
- 353 Hirn, A., & Co., Paris.—Gilt jewelry. 253
- 354 Levy, Isidore, Paris.—Imitation jewelry. 253
- 355 Maseurand Bros., Paris.—Gilt jewelry and pearls. 253
- 356 Murat & Co., Paris.—Gold-plated jewelry. 253
- 357 Philippe, Emile, Paris.—Jewelry. 253
- 358 Piel, A., Paris.—Imitation jewelry. 253
- 359 Regad, Anatole, jr., Paris.—Imitation diamonds. 253
- 360 Savary & Rondeleux, Paris.—Jewelry and imitation stones. 253
- 361 Sordoillet, Joseph François, Paris.—Steel jewelry. 253
- 362 Soyer, Paul, Paris.—Jewelry. 253
- 363 Topart Bros., Paris.—Imitation pearls and corals. 253
- 364 Touchard, Ernest, Paris.—Gilt church and theatrical ornaments. 253
- 365 Carmant, Adolphe, Paris.
a Jewelry. 253
b Fancy bronzes. 254
- 366 Cléray, E., Paris.
a Shell jewelry. 253
b Fancy articles. 254
- 367 Woodcock, F., Vaugirard.—Porcelain flowers. 254
- 368 Aubé, H., Paris.—Napkin ring and fastener. 254
- 369 Bapterosses, F., Paris.—Porcelain buttons and pearls. 254
- 370 Biqué & Dupressoir, Paris.—Feathers. 254
- 371 Blot, Eugène, Boulogne-sur-Mer.—Clay pipes. 254
- 372 Bondier, Ulbrich, & Co., Paris.—Meerscham and brier-wood pipes. 254
- 373 Bontems, B., Paris.—Moving and singing birds. 254
- 374 Bourgeois, senior, Paris.—Colors without poison, for toys. 254
- 375 Brodin, jr., Paris.—Aerostatic articles. 254

Fancy Articles, Stationery, Weapons.

- 376 Cohumer & Collet, Paris.—Children's and dolls' furniture. 254
- 377 Charageat, E., Paris.—Paragon and automatic umbrella. 254
- 378 Dehors, A., Paris.—Toys. 254
- 379 Delivré, L., Paris.—Artificial flowers. 254
- 380 Deschamps, Maurey, & Co., Paris.—Toilet brushes. 254
- 381 Détemmermann, P., Paris.—Porcelain flowers. 254
- 382 Didout, H., Son, Paris.—Clasps for pocket books, cigar cases, etc. 254
- 383 Dupont, A., Beauvais.—Ivory brushes. 254
- 384 Faivre, Paris.—Toys. 254
- 385 Favier, A., Paris.—Flowers and leaves. 254
- 386 Fiolet, L., Saint Omer (Pas de Calais).—Clay pipes. 254
- 387 Girondeau, François, Paris.—Fancy bronzes. 254
- 388 Gogly, Auguste, Paris.—Artificial flowers. 254
- 389 Gosse-Perier, Paris.—Artificial flowers. 254
- 390 Guyot & Migneaux, Paris.—Birds and insects made of flowers and feathers. 254
- 391 Hasslauer, Mrs., & Champeaux de, Givet (Ardennes).—Clay pipes. 254
- 392 Hiéland, L., & Co., Paris.—Feathers and artificial flowers. 254
- 393 Jumeau, F., Paris.—Dolls. 254
- 394 Kees, Ernest, Paris.—Fans. 254
- 395 Lamarre, Paris.—Fancy articles. 254
- 396 Loiseau, A., Son, Paris.—Toys. 254
- 397 Loonen, F., Paris.—Ivory brushes. 254
- 398 Maltête, Paris.—Toys. 254
- 399 Mayaud Bros., Paris.—Medals and ornaments. 254
- 400 Muzet & Co., Paris.—Hair work. 254
- 401 Pinson, Paris.—Shell, ivory, and pearl fancy articles. 254
- 402 Radiguet, Paris.—Toys. 254
- 403 Ravenet, senior, Paris.—Combs. 254
- 404 Sohn & Delabre, Paris.—Porcelain flowers. 254
- 405 Souchet & Co., Paris.—Enameled flowers. 254
- 406 Truffy, Paris.—Mechanical toys. 254
- 407 Vacquerel, P. E., Paris.—Decalcomanie. 254
- 408 Voisin, V. C., Paris.—Fancy articles. 254
- 409 Bapterosses, F., Paris.—Buttons and pearls of porcelain. 254
- 410 Alexandre, Paris.—Fans. 254
- 411 Walker, W., Paris.—Traveling articles. 255
- 412 Lenègre, A., Paris.—Photographic albums and fancy leather work. 255
- 413 Revillon Bros., Paris.—Furs. 256
- 414 Jacquemin, Paris.—Historical costumes. 257

Paper, Blank Books, Stationery.

- 415 Dubourguet, A., Paris.—Inkstands and office and artists' articles. 258
- 416 Gaffré & Caen, Paris.—Steel pens. 258
- 417 Gonthier, Dreyfus, & Co., Paris.—Stationery, lithography, and engravings. 258
- 418 Panier, Ernest, Paris.—Mathematical instruments. 258
- 419 Plateau, E., Paris.—Office stationery. 258
- 420 Poure, Gillot, O'Kelly, & Co., Boulogne-sur-Mer.—Steel pens and pen holders. 258
- 421 Rous, Ermond, Paris.—Inkstand. 258
- 422 Susse Brothers, Paris.—Fancy stationery. 258
- 423 Toiray, Maurin G., Paris.—Office stationery. 258
- 424 Bondier, Ulbrich, & Co., Paris.—Cigarette paper. 259
- 425 Bardou, J. P., Perpignan.—Cigarette paper. 259
- 426 Blanchet Bros., & Kléber, Paris.—Paper. 259
- 427 Bernard J., & Co., Paris.—Papers. 259
- 428 Haymann Bros., Paris.—Tissue papers. 259
- 429 Hennecart & Co., Paris.—Papers. 259
- 430 Lacroix Bros., Paris.—Writing papers and parchments. 259
- 431 Maguet, Paris.—Fancy stationery and engraving. 259
- 432 Marais and St. Marie Paper Mills, Paris.—Paper. 259
- 433 Lair, E., Paris.
a Bond paper. 259
b Printing paper. 260
- 434 Bécoulét & Co., Paris.
a White and fancy papers. 259
b Colored papers. 264
- 435 Canson & Montgolfier, Paris.—Paper. 260
- 436 Hutinet, D., Paris.—Bristol board and cards. 262
- 437 Laroche, A., Saulxures (Vosges).—Vegetable paste for pasteboard manufacturers. 262
- 438 Desfeux, Ph., Paris.—Leather roofing. 263
- 439 Bourgeois, Martin, jr., Paris.—Decorative paintings for apartments and fire-boards. 264
- 440 Roger & Montlouis, Paris.—Wall papers. 264

Weapons, etc.

- 441 Gévelot, Paris.—Guns and ammunition. 265
- 442 Jullien & Gauthey Bros., Paris.—Metallic cartridges. 265
- 443 Laffiteau & Rieger, Paris.—Fancy arms. 269

Surgical Instruments, Cutlery, Hardware.

Medicines, Surgery, Prothesis.

- 444 Badiolle, Henry, Tarbes (Hautes-Pyrénées).—Medicines. 272
- 445 Rigollet & Co., Paris.—Plasters. 272
- 446 Vie, Garnier, & Co., Paris.—Pharmaceutical preparations. 272
- 447 Valby, Dijon.—Medicinal capsules and pills. 272
- 448 Limousin, Paris.—Machine for the manufacture of capsules, and apparatus for inhaling oxygen gas. 274
- 449 Reynal, Léonce, Paris.—Physicians' case. 274
- 450 Brière, Jules, Alençon (Orne).—Hygienic nipples. 274
- 451 Benas, Jean Pierre, Paris.—Rubber surgical instruments. 276
- 452 Vergne & Chose Bros., Paris.—Rubber surgical instruments. 276
- 453 Rondeau Bros., Paris.—Rubber surgical instruments, truss. 276
- 454 Eliaers, A. E., Paris.—Chairs for invalids. 278

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 455 Lichtenfelder, Paris.—Locksmiths' tools. 280
- 455 *a* Segant, Paris.—Shoemakers' tools. 280
- 455 *b* Pottecher, B., Bussang (Vosges).—Iron covers and currycombs. 280
- 456 Carmoy, Celestin, Paris.—Brass and steel nails. 280
- 457 Dugoujon, J., senior, Paris.—Saws. 280
- 458 Limet, Lapareillé, & Co., Paris.—Files. 280
- 459 Rheims, Anatole, Paris.—Military equipments; screws. 280
- 460 Guillemin, Renaut, Nogent (Haute-Marne).—Cutlery. 281
- 461 Girard, Charles, Nogent (Haute-Marne).—Cutlery. 281
- 462 Sommelet, Courcelles (Haute-Marne).—Cutlery. 281
- 463 Thévenot, Felix, Nogent (Haute-Marne).—Cutlery. 281
- 464 Thinet, Paris.—Cutlery. 281
- 465 Vitry Bros., Paris.—Cutlery. 281
- 466 Charbonne-Thuillier, J., Nogent (Haute-Marne).—Cutlery. 281
- 467 Couvreur, Wichard, Nogent (Haute-Marne).—Pruning shears and cutlery. 281
- 468 Thomachot - Thuillier, Nogent (Haute-Marne).—Scissors and pruning shears. 281
- 469 Dissoire, Nogent (Haute-Marne).—Surgical instruments. 281
- 470 Denizet, Langres (Haute-Marne).—Cutlery. 281
- 470 *a* Scheidecker, Ch., Paris.—Shearing machines. 281
- 470 *b* Pérard, V., Paris.—Sheep shearing machines. 281
- 471 Chateau, Louis Auguste, Paris.—Emery paper and cloth for polishing glass. 282

- 472 Deplanque, senior, Maison-Alfort (Seine).—Whetstones. 282
- 473 Dumas, Fremy, Mrs., Paris.—Emery paper and cloth. 282
- 474 Durrschmidt, Lyons.—Whetstones. 282
- 475 Edeline, Amédée Jean, Paris.—Burnishing stones. 282
- 476 Fournier, Dondel, & Co., Paris.—Metallic fire fenders and bronze articles. 283
- 477 Bronzes Composition.—Artificial bronzes and zinc ornaments. 283
- 478 Marchand, Louis Léon, Paris.—Bronzes. 283
- 479 Martin, Louis, Paris.—Sheet iron ornaments. 283
- 480 Morel, A., Paris.—Bronze ornaments. 283
- 481 Perrot, Henry, Paris.—Bronzes. 283
- 482 Christofle & Co., Paris.—Goldsmiths' ware. 283
- 483 Froment-Meurice, Paris.—Goldsmiths' ware. 283
- 484 Cornu, Eug., & Co., Paris.—Bronzes. 283
- 485 Poussielgue - Rusand, Paris.—Bronzes and plated ware for churches. 283
- 486 Sauvage & Rück, Paris.—Bronzes. 283
- 487 Tahon, Felix, Lille.—Forged copper plates. 283
- 488 Susse Bros., Paris.—Bronzes. 283
- 489 Deny, Louis, Paris.—Construction materials. 284
- 490 Anthoni, G., Levallois-Perret (Seine).—Axles and springs for carriages. 284
- 491 Jeantaud & Co., Paris.—Carriage wheels. 284
- 492 David-Damoiseau & Co., Paris.—Chains. 284
- 493 Marquise Iron Co., Paris.—Chandeliers and stove pipes. 284
- 494 Mage, Senior, Lyons.—Woven wire for mattresses. 284
- 495 Sirot, C. & L., Charleville (Ardennes).—Nails. 284
- 496 Vachette Bros., Paris.—Locks for furniture. 284
- 497 Chappée, A., Le Mans (Sarthe).—Iron pipes for water and gas. 284
- 498 Chameroy & Co., Paris.—Water pipes and cocks. 284
- 499 Cazaubon, D., Paris.—Pumps and water closets. 284
- 500 Gallais, A., Paris.—Gilt nails. 284
- 501 Thiry, jr., Paris.—Artistic locksmiths' goods. 284
- Fabrics of Vegetable, Animal, or Mineral Materials.
- 502 Fromage, Lucien, & Co., Rouen.—Elastic fabric. 285
- 503 Bénas, Jean-Pierre, Paris.—Rubber surgical instruments. 285
- 504 Vergne & Chose Bros., Paris.—Rubber surgical instruments. 285

Rubber, Wooden, Metallic Fabrics, Vehicles.

- 505 Rondeau Bros., Paris.—Rubber surgical instruments. 285
- 506 Vital, A., Paris.—Lithographic press rollers. 285
- 507 Deschamps, Mauroy, & Co., Paris.—Toilet brushes. 286
- 508 Dupont, A., Beauvais (Oise).—Toilet brushes and prepared bristles. 286
- 509 Loonen, F., Paris.—Brushes. 286
- 510 Pitet, senior and junior, Paris.—Brushes. 286
- 511 Roullies & Co., Paris.—Carpet brushes. 286
- 512 Carue, Paris.—Ropes. 287
- 513 Arnold, E., Paris.—Metallic, glass, porcelain, and wooden letters; coats of arms of all nations. 288
- 514 Bornet, Paul, Paris.—Signs and leather letters. 288
- 515 Boudvillain, J., Paris.—Trophy of flags. 288

- 516 Pichot, E., Paris.—Ornamental labels. 288
- 517 Moitrier, Leon, Bénaménil (Meurthe).—Wicker baskets. 289
- 518 Policard, René, Paris.—Flower stands, etc. 289

Carriages, Vehicles, and Accessories.

- 519 Mühlbacher, Paris.—Carriages. 292
- 520 Gaudichet, Vierzon (Cher).—Carriages. 292
- 521 Desouches, Paris.—Carriages. 292
- 522 Binder Bros., Paris.—Carriages. 292
- 523 Million, Guiet, & Co., Paris.
a Carriages. 292
b Harness. 296
- 524 Perreaux, Paris.—Steam velocipede. 293
- 525 Huret, N., Paris.—Carriage. 293
- 526 Fortin Bros., Paris.—Harness felts. 296

GERMANY.

(South of Nave, Columns 28 to 38.)

Chemical Manufactures.

Chemical Manufactures.

COLLECTIVE EXHIBIT OF THE
GERMAN UNION OF MANUFACTURING
CHEMISTS. — MANUFACTURED CHEMICALS, ETC. 200-203

- 1 Kahlbaum, C. A. F., Berlin.
- 2 Weidenbusch & Co., Wiesbaden.
- 3 Vorster & Grüneberg, Kalk, near Cologne.
- 4 Schuchardt, Theodor, Görlitz.
- 5 Koepp, Rud., & Co., Oestrich.
- 6 Saame & Co., Ludwigshafen.
- 7 Th. Wurtz's successors, Leipsic.
- 8 Von Heyden, F., Dresden.
- 9 Joint Stock Chemical Works (formerly E. Schering, Berlin).
- 10 Jobst, Friedrich, Stuttgart.
- 11 Fischer & Schmitt, Höchst.
- 12 Brohme & Co., Bergen-on-Dumme.
- 13 Bartels & Koyeman, Frohse.
- 14 Tromsdorf, H., Erfurt.
- 15 Lindenbauer, Otto, Hanau.
- 16 Marquart, L. C., Bonn.
- 17 Loefflund, Edward, Stuttgart.
- 18 Suhr, W., Altona.
- 19 Heyl, J. F., & Co., Berlin.
- 20 Sauberlich, Anton, Zwickau.
- 21 Bloedner's, Joh. Chr., Son, Gotha.
- 22 Hübner, B., Rehmsdorf.
- 23 Saxon Thuringian Joint Stock Co., Halle-on-Saale.
- 24 Ruffer & Co., Breslau.
- 25 Hisgen, G. C., Nassmühle, near Hanau.
- 26 Frankfort Aniline Factory, Gans & Leonhardt, Frankfort-on-Main.
- 27 Clever, Joh., Werden, Rhine Province.
- 28 Joint Stock Co. for Manufacturing Aniline, at Rummelsburg, Berlin.
- 29 Nuremberg Ultramarine Factory, Johann Zeltner, Nuremberg.
- 30 Gysae, Robert, Oberlößnitz.
- 31 Marienberg Blue Color Works Joint Stock Co., Marienberg.
- 32 Neubert, C. Ed., Blankenburg.
- 33 Kaiserslautern Ultramarine Works, Kaiserslautern.
- 34 Rosenstein, W., Stettin.
- 35 Vossen Bros. and L. Vossen & Co., Aix-la-Chapelle.
- 36 Hirsch & Merzenich, Cologne.
- 37 Bayer & Co., Fr., Barmen.
- 38 Johann Maria Farina, gegenüber dem Altmarkt, Cologne.
- 39 Johann Anton Farina, zur Stadt Mailand, Cologne.
- 40 Mack, Ernst, Reichenhall.

Chemical Manufactures, Ceramics, Furniture.

- 41 Goedecke & Co., Leipsic.
 42 Kluge & Pöritzsch, Leipsic.
 43 Bernhardt, J., Leipsic.
 44 Brückner, Lampe, & Co., Leipsic.
 45 Sachse, E. & C., Leipsic.
 46 Haensel, Heinr., Pirna-on-Elbe.
 47 Wolff & Son, F., Carlsruhe.
 48 Langwisch, Bernh., Hamburg.
 49 Lohse, Gustav, Berlin.
 50 Wilhelmi, F., Reudnitz.
 51 Lüder & Leidloff's successors, Dresden.
 52 Kunheim & Co., Berlin.
 53 Haarmann W., Holzminden.
- 54 Nörr, Eugene, Berlin.—Siphon valve. 200
- COLLECTIVE EXHIBIT OF BAVARIAN METAL LEAF AND BRONZE COLORS.** 202
- 55 Hoenle, Leo, Munich.
 56 Wiessner, Joh. Georg & Bub., Schwabach.
 57 Fuchs, Gg. L., & Sons, Fürth.
 58 Nuchterlein, Fried., Fürth.
 59 Metz, Friedrich, Fürth.
 60 Stoeber & Segitz, Fürth.
 61 Schaetzler, G. E., Nuremberg.
 62 Weidner, J. L. & P., Nuremberg.
 63 Reich, H. & Chr., Nuremberg.
 64 Metal Beaters' Union of Fürth, Nuremberg, Schwabach, and Zirndorf, Fürth.
 65 Eiermann & Tabor, Fürth.
 66 Brunnbauer, Heinr., Munich.
 67 Spiegelberger, Fürth.
 68 Cramer, J. W., Fürth.
 69 Beckh, Georg Adam, Nuremberg.
 70 Weiss, Feyertag, & Schlenk, Nuremberg.
 71 Kühn's Wire Factory, Nuremberg.
 72 Meier, J. C., Fürth, near Nuremberg.
- 73 Beyer, Edward, Chemnitz.—Chemical inks. 202
 74 Jänecke Brothers & F. Schneemann, Hanover.—Printers' colors, varnishes. 202
 75 Vogel, M. B., Leipsic.—Colors. 202
 76 Johann Maria Farina, Jülichsplatz No. 4, Cologne.—Eau de Cologne. 203
 77 F. Maria Farina, Glockengasse 4711, Cologne.—Eau de Cologne. 203
 78 Schimmel & Co., Leipsic.—Ether, oils, essences. 203
 79 Gadamer & Jaeger, Waldenburg.—Swedish matches. 204
 80 Hochstatter, Heinrich, Langen, near Darmstadt.—Matches, etc. 204
- Ceramics—Pottery, Porcelain, Glass, etc.**
- 81 Mendheim, Georg, Berlin.—Plans for stove; clay goods. 206
 82 Gundlach Bros., Grossalmerode.—Clay goods. 207
 83 Gundlach, W., & Son, Grossalmerode.—Clay goods. 207
 84 Stettin Chamotte Works, Joint Stock Company.—Chamotte retorts. 207
 85 Gundlach, Joh., jr., Grossalmerode.—Clay goods. 207
 86 Lonitz Hugo, Neuholdenslaben.—Clay goods. 207
 87 Villeroy & Boch, Mettlach.—Mosaic tiles. 208
 88 Joint Stock Company for Telegraph Supplies, Berlin.—Porcelain for chemical uses. 210
 89 Royal Porcelain Works, Berlin.—Porcelain. 213
 90 Hanke, Reinhold, Höhr, near Coblenz.—Antique German stone pitchers. 213
 91 Merkelbach & Wick, Grenzhausen.—Clay goods. 213
 92 Joint Stock Association of Looking-glass Manufacturers and Manufacturing Chemists of St. Gobain, & Channy & Cirey, Stolberg, near Aix-la-Chapelle.—Looking-glass plates. 214
- COLLECTIVE EXHIBIT OF BAVARIAN LOOKING-GLASSES AND LOOKING-GLASS PLATE.** 214
- 93 Schaller, Joh., Fürth.
 94 Vogel, G., Fürth.
 95 Weghorn, J. G., Fürth.
 96 Berlin, J. W., Fürth.
 97 Heilbronn, Leop., Fürth.
- 98 Underberg, Albrecht H., Rheingeb.—Hollow glassware. 215
 99 Greiner, Elias, Nephew's Son, Lauscha, near Sonneberg.—Enameling colors. 216
- Furniture and Objects of General Use in Construction and in Dwellings.**
- 100 Friedrich, O. B., Dresden.—Fine furniture. 217
 101 Gutte, Louis, Görlitz.—Wood carving. 217
 102 Kimbel, Martin, Breslau.—Fine furniture, etc. 217
 103 Schöttle, Georg, Stuttgart.—Furniture. 217
 104 Stövesandt & Kollmar, Carlsruhe.—Fine furniture. 217
 105 Turpe, A., jr., Dresden.—Furniture. 217
 106 Völker, Otto, Berlin.—Carved furniture. 226
 107 Tenner, A. B., Eisfeld.—Wooden blinds. 217
 108 German Sewing Machine Factory, Frankfurt-on-Main.—Ship furniture for the prevention of sea-sickness. 217
 109 Neuhausen, J., Berlin.—Billiard table. 217
 110 Bahse & Haendel, Chemnitz.—School desk and bench. 217
 111 Mayer's Art Institution for the Manufacture of Church Furniture and Decorations, Munich.—Wooden statues and altars. 217
 112 Magnus, G., & Co., Berlin.—Billiard balls. 217
 113 Friedrich, Hch. Ottm., Beierfeld, near Schwarzenberg.—Spoons. 218

SMITH & WESSON, *Springfield, Mass., U. S. A.*

VIENNA,

1873.



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INCORPORATED 1835.

DELAWARE

MUTUAL

SAFETY INSURANCE COMPANY,

Office, S. E. Cor. Third and Walnut Sts.,

PHILADELPHIA.

*MARINE INSURANCES on Vessels, Cargo, and Freights
to all parts of the world.*

*INLAND INSURANCES on Goods by river, canal, and
land carriage to all parts of the Union.*

*FIRE INSURANCES on Merchandise generally, on
Stores, on Dwellings, Houses, etc.*

Assets of the Company, Nov. 1, 1875.

\$150,000	UNITED STATES Six Per Cent. Loan, 1897,	- - - - -	\$185,250 00
184,000	STATE OF PENNSYLVANIA Six Per Cent. Loans,	- - - - -	205,540 00
325,000	CITY OF PHILADELPHIA Six Per Cent. Loans (exempt from Tax),	- - - - -	350,575 00
250,000	STATE OF NEW JERSEY Six Per Cent. Loans (1880 to 1902),	- - - - -	268,460 00
100,000	CITY OF PITTSBURGH Seven Per Cent. Loans,	- - - - -	107,000 00
100,000	CITY OF BOSTON Six Per Cent. Loans,	- - - - -	107,000 00
20,000	PENNSYLVANIA RAILROAD First Mortgage Six Per Cent. Bonds,	- - - - -	20,800 00
25,000	WESTERN PENNA. RAILROAD MORTGAGE Six Per Cent. Bonds (Penna. R. R. Guarantee),	- - - - -	19,500 00
44,000	STATE OF TENNESSEE Six Per Cent. Loan,	- - - - -	20,680 00
19,000	PENNSYLVANIA RAILROAD COMPANY, 380 SHARES STOCK,	- - - - -	19,380 00
6,050	NORTH PENNSYLVANIA RAILROAD COMPANY, 121 SHARES STOCK,	- - - - -	6,413 00
5,000	CENTENNIAL BOARD OF FINANCE, 500 SHARES STOCK,	- - - - -	5,000 00
40,000	AMERICAN STEAMSHIP COMPANY Six Per Cent. Bonds (Penna. R. R. Guarantee),	- - - - -	29,600 00
271,950	LOANS ON BOND AND MORTGAGE, first liens on City Properties,	- - - - -	271,950 00
\$1,540,000 PAR.		COST, \$1,542,718 44	
MARKET VALUE,		- - - - -	\$1,617,148 00
REAL ESTATE at Philadelphia and Pittsburgh,		- - - - -	120,000 00
BILLS RECEIVABLE for Insurances made,		- - - - -	213,574 55
BALANCES DUE AT AGENCIES—Premiums on Marine Policies—Accrued in- terest and other debts due the Company,		- - - - -	67,113 28
STOCK AND SCRIP, etc., of Sundry Corporations, \$17,043.		Estimated value,	6,789 00
CASH—On deposit in Banks,		\$175,531 46	
Loaned on call with collaterals,		120,000 00	
In Office,		839 84	
			\$296,371 30
			\$2,320,996 13

DIRECTORS:

Thomas C. Hand,
Edw. Darlington,
Hugh Craig,
James C. Hand,
H. Jones Brooke,
Spencer McIlvaine,
Samuel E. Stokes,
Jas. Traquair,
Jas. B. McFarland,

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Household Utensils and Furniture, Woven Goods.

- 114 Schreiner, Anton, Nabburg.—
Drinking utensils sheathed with tin. 218
- 115 Wimmer, Woldemar, Annaberg,
Saxony.—Gold and silver wire-work. 218
- 116 Drechsler, Julius, Berlin.—Look-
ing-glass. 219
- 117 Voeltzkow, W., Berlin.—Mirrors
and picture frames. 220
- 118 Voeltzkow, G. W., jr., Berlin.—
Metal frames. 220
- 119 Massman F., Kiel.—Gold cor-
nices. 220
- 120 Joint Stock Co. for the Manufac-
ture of Bronze Goods and Zinc Castings,
Berlin.—Chandelier of bronze, and zinc
castings. 223
- 121 Körner & Co., Berlin.—Lamps. 223
- 122 Prantl, Fr. Anton, Munich.—Lamp
shades made of folded paper. 223
- 123 Schwarz, J. von, Nuremberg.—Gas-
burners made of soapstone. 223
- 124 Neufeldt, Adolph A., Elbing.—
House and kitchen utensils. 224
- 125 Normann, Joh. Georg, Nuremberg.
—Moulds for confectioners' use. 224
- 126 Wagner & Starker, Stuttgart.—
Parquet tiles. 208

Yarns and Woven Goods of Vegetable
or Mineral Materials.

- 127 Franck & Co., Schlettstadt, Alsace.
—Woven metal goods. 228
- 128 Herman, Jun. L., Dresden.—
Woven wire goods, etc. 228
- 129 Scholler, Ph. Jacob, & Sons, Neu-
stadt-on-Hardt.—Woven wire goods. 228
- 130 Siemsen, Joh., Hameln-on-Weser.
—Manilla hemp goods. 229

COLLECTIVE EXHIBIT OF COTTON
AND MIXED GOODS FROM THE GLADBACH
DISTRICT. 230

- 131 Gladbach Joint Stock Spinning and
Weaving Mills, M. Gladbach.
- 132 Busch Bros., M. Gladbach.
- 133 Droste & Siepermann, M. Gladbach.
- 134 Ercklentz, Max, & Co., M. Gladbach.
- 135 Goertz & Kirch, M. Gladbach.
- 136 Willemsen, P., Widow, M. Glad-
bach.
- 137 Rosenberg & Cohen, M. Gladbach.
- 138 Schlafhorst & Brüel, M. Gladbach.
- 139 Everling, Carl, & Co., M. Gladbach.
- 140 Ercklentz & Reuter, M. Gladbach.
- 141 Bötterling & Schultze, M. Glad-
bach.
- 142 Essers, Martin, M. Gladbach.
- 143 Croon Bros., M. Gladbach.
- 144 Langen, Kruchen, & Borrenkott,
M. Gladbach.
- 145 Wolff, Fr., M. Gladbach.
- 146 Hellendall & Steinberg, M. Glad-
bach.
- 147 Grunwald & Klei, Rheydt.
- 148 Kropp, J. P., Rheydt.
- 149 Nacken, G. H., Rheydt.
- 150 Sanders, W., Rheydt.
- 151 Axt, Heinrich, Rheydt.

- 152 Oechelhäuser, Rheydt.
- 153 Coenen & Wolter, Odenkirchen.
- 154 Erckens & Co., Grevenbroich.
- 155 Rolffs & Co., Siegfeld.
- 156 Steam Netting Factory and Weav-
ing Mills, Joint Stock Co., Itzehoe, Hol-
stein.—Nets and sail cloth. 230
- 157 Rischbieter, Carl, Dessau.—Win-
dow-shades. 230
- 158 Schlieper & Baum, Elberfeld.—
Calico. 232
- COLLECTIVE EXHIBIT OF WUR-
TEMBERG MANUFACTURERS OF LINEN
GOODS. 233

- 159 The Bleach, of Blaubeuren.
- 160 Eckstein & Kahn, Stuttgart.
- 161 Faber, Carl, Stuttgart.
- 162 Pichler, Hermann, Urach.
- 163 Beck, E., Ulm.
- 164 Steam Ticking Mills, Göppingen.
- 165 Kolb & Schüle, Kirchlieun.
- 166 Mayer, S., & Co., Bielefeld.—Linen
goods. 233

Woven and Felted Goods of Wool, etc.

- 167 Bergmann & Co., Berlin.—Zephyr
wool. 235
- 168 Hüffer, Heinr., Crimmitschau.—
Vigogne worsteds. 235
- 169 Lewald, Heinr., Breslau.—Wad-
ding. 235
- 170 Scholz, Paul, Friedberg-on-Oder.
—Knitting yarns, etc. 235
- 171 Tittel & Krüger, Leipsic.—Dyed
zephyr wools. 235
- RHENISH COLLECTIVE EXHIBIT
OF CLOTHS. 235
- 172 Erckens, Joh., Sons, Burtscheid,
near Aix-la-Chapelle.
- 173 Ackens, Grand, Ry & Co., Eupen.
- 174 Delius, C., Aix-la-Chapelle.
- 175 Jansen, Joh. Wilh., Montjoie.
- 176 Knops, Aloys., Aix-la-Chapelle.
- 177 Schöller, J. P., Düren, near Aix-la-
Chapelle.
- 178 Wiese Bros., Werden-on-Ruhr.

- 179 Weiss Bros., Leipsic.—Cloths. 235
- 180 Wapler, R. H., Kirchberg.—Cloths,
etc. 235
- 181 Marthaus, Ambrose, Oschatz.—
Felt goods. 235
- 182 Doettinger, Johannes, Reutlingen.
—Coverlets, etc. 237
- 183 Kauffmann, Carl, Reutlingen.—
Coverlets, etc. 237

COLLECTIVE EXHIBIT OF ELBER-
FELD, MANUFACTURERS OF ITALIAN
CLOTH AND TAILORS' TRIMMINGS. 238

- 184 Boeddinghaus, Fr., & Son, Elber-
feld.
- 185 Boeddinghaus, Wilh., & Co., El-
berfeld.
- 186 Herminghaus & Co., Elberfeld.
- 187 Jung & Simons, Elberfeld.
- 188 Lucas Bros., Elberfeld.

Woven Goods, Clothing, Jewelry, Gold and Silver Ware.

- 189 Schaefer & Co., Elberfeld.
 190 Weerth, De, & Co., Elberfeld.
 191 Wolff, R. & E., Elberfeld.
 192 Worsted Mills, Kaiserslautern.—
 Worsted. 238
 193 Becker & Hoffbauer, Berlin.—Car-
 pets. 239
 194 Gevers & Schmidt's Carpet Fac-
 tory, Schmiedeberg, Silesia.—Carpets. 239
 195 Valckenberg & Schoen, Worms.—
 Artificial wool. 240
 196 Cohn, Emanuel, Wüstegiersdorf.
 —Damask table-covers. 241
 197 Meyer, Joseph, Dresden.—Damask
 table-covers. 241
 198 Linden Steam Mills, Joint Stock
 Co., Linden, near Hanover.—Velvet. 241
 199 Weigert & Co., Berlin.—Furniture
 plushes. 241

Silk and Silk Fabrics.

- 200 Mez, Carl, & Son, Freiburg, Baden.
 —Sewing-silks. 243
 201 Gebhard & Co., Elberfeld.—Satins,
 etc. 245
 202 Gressard & Co., Hilden.—Silks,
 etc. 245
 203 Massing, Frères, & Co., Püttlingen,
 Lorraine.—Silk plushes. 247
 204 Escales & Hatoy, Saargemünde.—
 Silk plushes. 247

Clothing, Jewelry, etc.

- 205 Hake, V., Mrs., Berlin.—Ladies'
 underwear. 250
 206 Gros & Co., Bruchsal, Baden.—
 Corsets. 250
 207 Ottenheimer & Sons, J. M., Stutt-
 gart.—Corsets. 250
 208 Gulden, Heinr., Chemnitz.—Em-
 broided gloves. 251
 209 Woller, Fr. Ehreg., Stollberg, near
 Chemnitz.—Cotton hosiery. 250
 210 Kaufman, A. & C., Berlin.—Paper
 collars. 250
 211 Kreutznach, Ed., Chemnitz.—
 Woolen hosiery. 250
 212 Felt Manufactory of Wurtemberg,
 Giengen.—Felt goods. 251
 213 Grude, F., Oldesloe, Schleswig-
 Holstein.—Felt hats. 251
 214 Natanson & Hurwitz, Berlin.—
 Felt shoes. 251
 215 Wolf, S., Mayence.—Shoe mate-
 rials. 251
 216 Doerffel, C. G., Sons, Eibenstock.—
 Kid gloves, etc. 251
 217 Krebs, F. Eugen, Regensburg.—
 Kid gloves. 251
 218 Lehmann, Heinr., Berlin.—Kid
 gloves. 251
 219 Seittles, D., Esslingen.—Leather
 gloves. 251
 220 Elstätter & Urbino, Carlsruhe.—
 Leather gloves. 251
 221 Ranniger, J. L., & Sons, Altenburg.
 —Leather gloves. 251

- 222 Kuehn, Heinr., Berlin.—Embroid-
 ery patterns. 252
 223 Schneider, Bruno, Buchholz, Sax-
 ony.—Embroideries. 252
 224 Wechselmann, B., Berlin.—Laces,
 etc. 252
 225 Aren & Blumenhein, Berlin.—
 Embroideries. 252
 226 Hirschberg, M., & Co., Eibenstock.
 —Embroideries. 252
 227 Hesselbein, Sophie, Berlin.—Em-
 broideries. 252

COLLECTIVE EXHIBIT OF IDAR-
OBERSTEIN.—POLISHED STONES, AGATE
GOODS, ETC. 253

- 228 Boehm, Philipp, Oberstein.
 229 Hahn, Carl, Idar.
 230 Leyser, Wilhelm, Idar.
 231 Wild, IX, J. C., Idar.
 232 Hahn, Philipp, Idar.
 233 Heydt, Friedrich, Idar.
 234 Caesar, Louis, Idar.
 235 Herringer, Johann, Idar.
 236 Fuchs, Friedrich August, Ober-
 stein.

COLLECTIVE EXHIBIT OF GOLD,
SILVER, AND PLATED WARE. 253

- 237 Spranger, N., Schwäb. Gmünd.
 238 Renner & Buchler, Schwäb. Gmünd
 239 Wöhler, Edward, Schwäb. Gmünd
 240 Ott & Co., B., Schwäb. Gmünd.
 241 Zieher, Ottmar, Schwäb. Gmünd.
 242 Erhard & Sons, Schwäb. Gmünd.
 243 Hauber, Gustav, Schwäb. Gmünd.
 244 Soergel & Stollmaier, Schwäb.
 Gmünd.
 245 Pleuer & Co., Stuttgart.
 246 Strohmaier & Co., Stuttgart.
 247 Gabler Brothers, Schorndorf.
 248 Ritter & Co., Esslingen.
 249 Zimmermann, E. G., Hanau.
 250 Geisel & Hartung, Hanau.
 251 Kurr-Schüttner, C., Hanau.
 252 Steinhauer & Co., Hanau.
 253 Weber, O., & Co., Hanau.
 254 Weishaupt, C. M., Sons, Hanau.
 255 Bissinger, C., Sons, Hanau.
 256 Kraul & Bier, Hanau.
 257 Hertel, C., & Son, Hanau.
 258 Krug, J. M., Hanau.
 259 Winkler, Carl, Hanau.
 260 Drescher & Kiefer, Hanau.
 261 Roth, J., Hanau.
 262 Schahl, C. W., Hanau.
 263 Zeuner, Hugo, Hanau.
 264 Dingeldein Bros., Hanau.
 265 Stork & Sinsheimer, Hanau.
 266 Backer & Co., Hanau.
 267 Volz-Bier, A., Hanau.
 268 Schoenfeld, E., jr., Hanau.
 269 Schantz & Katz, Pforzheim.
 270 Spahn, C. C., Pforzheim.
 271 Keller, Heinr., Pforzheim.

Gold and Silver Ware, Fancy Goods, Stationery, Weapons.

- 272 Lay, Edward, Pforzheim.
 273 Heidegger, W., & Co., Pforzheim.
 274 Deyhle Bros., Pforzheim.
 275 Kiehnle, Aug., Pforzheim.
 276 Gerwig, Aug., Pforzheim.
 277 Bitzer Bros., Pforzheim.
 278 Wild & Co., Pforzheim.
 279 Becker, Fritz, Pforzheim.
 280 Siebenpfeiffer, C., Pforzheim.
 281 Lodholz, Fried., Pforzheim.
 282 Koch & Bergfeld, Bremen.
 283 Humbert & Heylandt, Berlin.
 284 Binder, W., Schwäb. Gmünd.
 285 Becker, Chr., Pforzheim.
 286 Felge, Paul, Berlin.

- 287 Burchardt, C. A., Berlin.—Artificial flowers and fancy articles. 254
 288 Hochstetter, B., Berlin.—Artificial flowers and fancy articles. 254
 289 Berlin Umbrella Factory, Berlin.—Umbrellas. 254
 290 Wingender Bros., Höhr, Nassau.—Clay and bruxere pipes. 254
 291 Meyer, Heinr. Ad., Hamburg.—Ivory goods. 254
 292 Peine, Edward, Hamburg.—Cuff buttons. 254
 293 Jordis, Carl, Frankfort-on-Main.—Fine hair goods. 254

BAVARIAN COLLECTIVE EXHIBIT
 OF TOYS AND SMALL WARES. 254

- 294 G. J. Pabst, Nuremberg.
 295 Hinrichsen, W., Nuremberg.
 296 Eichner, G. L., & Son, Nuremberg.
 297 Issmayer, J. A., Nuremberg.
 298 Lerch, A., Nuremberg.
 299 Norrmann, J., Nuremberg.
 300 Helmbrecht, G., Nuremberg.
 301 Schleuerpflug, E., Nuremberg.
 302 Stief, J., Nuremberg.
 303 Söhnlein, H., Nuremberg.
 304 Strobel, J. P., Nuremberg.
 305 Baudenbacher, C., Nuremberg.
 306 Kithil, A., Nuremberg.
 307 Uebelacker, L., Nuremberg.
 308 Hess, Math., Nuremberg.
 309 Schradin, A. F., Fürth.
 310 Fischer, J. G., Erlangen.
 311 Schlenk & Lutzenberger, Nuremberg.
 312 Probst, Gottfr., Nuremberg.
 313 Hahn, Gottlieb, Fürth.
 314 Ott, Gebhard, Nuremberg.
 315 Ziegele & Hauck, Fürth.
 316 Keller, Conrad, Fürth.
 317 Scheidig, St., & Son, Fürth.
 318 Christian, J. F., Nuremberg.
 319 Pruckner, D., Munich.
 320 Bettman & Kupfer, Bayreuth.
 321 Stolze, F. E., Bayreuth.
 322 Schlegel, J., Nuremberg.
 323 Putzin, K., Nuremberg.

- 324 Sickling H., Nuremberg.
 325 Plank, E., Nuremberg.
 326 Barth & Wagner, Rodach, near Coburg.—Toys. 254
 327 Dressel, Cuno, & Otto, Sonneberg, Thuringia.—Toys. 254
 328 Schunemann, L., Magdeburg.—Dolls. 254
 329 Hawsky, Adalbert, Leipsic.—Lanterns for illumination. 254
 330 Kieling, Joh., Weinsheim, near Worms.—Mechanical apparatus, etc. 254
 331 Oehme, J. D., & Sons, Grunhainichen.—Toys. 254
 332 Lochbaum, N., Berlin.—Photograph album. 255
 333 Vitè, Francois, Berlin.—Leather goods. 255

Paper, Blank Books, Stationery.

- 334 Faber, A. W., Stein, near Nuremberg.—Lead pencils. 258
 335 Pensel, H., & Co., Ludwigsstadt, Bavaria.—Slates, etc. 258
 336 Schwanhäusser, Nuremberg.—Lead pencils, etc. 258
 337 Büttner, Ed., & Co., Berlin.—Fine papers. 259
 338 Heinitz & Seckelson, Berlin.—Confectioners' papers, etc. 259
 339 Mayer, M., Ehrenbreitstein, Rh. Prussia.—Envelopes. 259
 340 Meissner, C. F., & Son, Rathsdamnitz, near Stolp.—Papers, etc. 259
 341 Munich-Dachau Joint Stock Paper Mill, Munich.—Silk paper, etc. 259
 342 Schött, Hermann, Rheydt, Rh. Prussia.—Fancy papers, etc. 259
 343 König, J. C., & Ebhart, Hanover.—Account books, etc. 261
 344 Rufus, Fr. Wilh., Dortmund.—Account books, etc. 261
 345 United Stralsund Joint Stock Playing Card Manufactory, Stralsund.—Playing cards. 262
 346 Adler, Geo., Buchholz, Saxony.—Paper box work. 262
 347 Schlesinger, Martin, Berlin.—Congratulation cards. 262
 348 Wiskott, C. T., Breslau.—Labels. 262
 349 Haenle, Leo., Munich.—Gold and silver paper-hangings. 264
 350 Herting, C., Einbeck, Province Hanover.—Paper-hangings. 264
 351 Dessauer, Alois, Aschaffenburg.—Fancy colored papers. 264
 352 Stern, Wilh., & Co., Fürth.—Fancy colored papers. 264
 353 Werner & Schumann, Berlin.—Patent letters. 264

Weapons, etc.

- 354 Schilling, V. Chr., Suhl.—Military weapons. 269

Medicine, Surgery, Prothesis.

- 355 Scheller, Ferdinand, Coburg.—Malt preparations, etc. 273

Medical Appliances, Hardware, Cutlery, Rubber and Wooden Goods.

356 Wolff, F. A., & Sons, Heilbronn.—
Pharmaceutical apparatus, etc. 274

357 Gehrig Bros., Berlin.—Necklaces
for teething infants. 278

Hardware, Edge-tools, Cutlery, and
Metallic Products.

358 Vorster, R. & H., Hagen, West-
phalia.—Edge-tools, etc. 280

359 Eisenführ, Wilh., Berlin.—
Tools. 280

360 Böker, H., & Co., Solingen.—Cut-
lery, etc. 281

361 Hessenbruch, T., & Co., Ronsdorf.
—Steel goods, etc. 281

362 Höller, J. S., & Co., Solingen.—
Steel goods, etc. 281

363 Wellmann, Fr., Altona.—Cut-
lery. 281

364 Leykauf, George, Nuremberg.—
Burnishing stones. 282

365 Felsing, Conrad, Berlin.—Orna-
mental castings. 283

366 Castner, A., Berlin.—Two
eagles. 283

367 Gäraflich, Stolberg, Wernigerone-
sche Factory, Ilseburg.—Ornamental
castings. 283

368 Amsberg, Adolphe, Aix-la-Cha-
pelle.—Door knobs. 284

369 Brousson, J., & Son, Neuwied-on-
Rhine.—Nails, etc. 284

370 Roehle, Louis, Dresden.—Door and
window knobs. 284

371 Wire and Screw Factory, Falkau.
—Screws. 284

372 Koch & Bein, Berlin.—Metal let-
ters. 284

Fabrics of Vegetable, Animal, or Min-
eral Materials.

373 Rhenish Hard Rubber Goods Fac-
tory, Mannheim.—India rubber combs,
etc. 285

374 Gennermann, Bros., Nuremberg.—
Brushes. 286

375 Reissbarth, G. C., Son, Nurem-
berg.—Brushes. 286

376 Kochs, Gustav, Broich, near Muhl-
heina-on-Ruhr.—Hemp rope. 287

377 Lorenz, Gustav, Bockau, Saxony.—
Basket ware. 289

378 Cordes & Ellgass, Delmenhorst,
near Bremen.—Corks. 289

379 Lindemann, Carl, Dresden.—
Corks. 289

380 Lürssen, Carl, Delmenhorst, near
Bremen.—Corks. 289

381 Praechter, Bros., & Co., Heidel-
berg.—Corks. 289

382 Gagel, Lorenz, Lichtenfels.—Bas-
ket goods. 289

Carriages, Vehicles, and Accessories.

383 Joint Stock Wagon Works, Berlin.
—Fine carriages. 292

384 Dick & Kirschten, Offenbach-on-
Main.—Axles for fine carriages. 293

AUSTRIA.

(South of Nave, Columns 23 to 28.)

Chemical Manufactures.

Chemical Manufactures.

1 Windspach, E., Gorz.—Cream of
tartar. 200

2 Mook, John Peter, Vienna.—Ex-
tracts of soap and pine spurs, kali
cream. 201

3 Weineck, Ignaz, Stockerau.—Can-
dles, soap, toilet soap. 201

4 Fritsch, Ferdinand, Vienna.—
Soap. 201

5 Sarg, Son, & Co., F. A., Liesing, near
Vienna.—Artificial wax candles, soap,
glycerine. 201

6 Dobel, Paul, Boryslaw, Galicia.—
Crude and melted ozocerite. 201

7 Král, Franz John, Olmutz, Moravia.
—Saccharine soap. 201

8 Sell, Carlo, Pirano, Istria.—
Soap. 201

9 Demartini, I., Prague.—Toilet
soap. 201

10 Calderara & Bankmann, Vienna.—
Toilet and glycerine soap. 201

11 Diedek's Son, A. C., Vienna.—
Soaps. 201

12 Prochaska, Franz, Prague.—Toilet
soap. 201

13 Fritsch, Ferdinand, Vienna.—Copy-
ing ink, colors. 202

14 Przibram & Co., Vienna.—Alizarine,
Adrianople red. 202

15 Richter, Gustav Heinrich, Warns-
dorf.—Lac varnish. 202

16 Palme, Elias, Steinschonan, Bohe-
mia.—Glass and bronze lustre. 202

17 Herbert, Franz Paul, Klagenfurt.—
Ceruse. 202

18 Riha, Ernst, Pilsen, Bohemia.—
Water colors for artists. 202

19 Andés & Son, Vienna.—Lac, varnish,
oil color, mastic. 202

20 Ecker, Alexander, Stockerau, near
Vienna.—Colors for painters and carriage
varnishers. 202

Chemical Manufactures, Ceramics, Glass, Furniture.

- 21 Wuste, F., Vienna.—Colors for stone and copper-plate printing. 202
- 22 Schmidl, Salomon, Misslitz, Moravia.—Essential oils, essences. 203
- 23 Kurzhalss, Julius, Fetschen-on-the-Elbe.—Essential oils, essences. 203
- 24 Weineck, Ignaz, Stockerau.—Perfumery. 203
- 25 Fritsch, Ferdinand, Vienna.—Perfumery. 203
- 26 Sarg, Son & Co., F. A., Liesing, near Vienna.—Toilet articles. 203
- 27 Calderara & Bankmann, Vienna.—Perfumery. 203
- 28 Diedek's Son, A. C., Vienna.—Perfumery. 203
- 29 Prochaska, Franz, Prague.—Perfumery. 203
- 30 Pollak, Jacques, Vienna.—Essences, essential oils. 203

Ceramics—Pottery, Porcelain, Glass, etc.

- 31 Eichler, Edward, Dux.—Syderolith and terra cotta pottery. 206
- 32 Feitel, Traugott, Vienna.—Painted pottery. 206
- 33 Kalla, Joseph, Prague.—Parlor stove and articles of clay. 207
- 34 Klammerth, Alois, Znaim, Moravia.—Earthenware vessels. 210
- 35 Zasche, Joseph, Vienna.—China. 210
- 36 Fischer, Samuel, Vienna.—China. 210
- 37 Tschinkel, Anton, Eichwald, near Teplitz, Bohemia.—China and articles made from meteoric stones. 210
- 38 Wagenmann, Gustave, Vienna.—Petroleum and mineral wax. 210
- 39 Count v. Thun, Klosterle, Bohemia.—China articles of luxury. 210
- 40 Klammerth, Alois, Znaim, Moravia.—Majolica work. 211
- 41 Eberhardt, Carl, Prague.—China-ware, flowers made of china, bouquets, wreaths, and jewelry. 213
- 42 Chemical Technical Manufactory, Elbogen, Bohemia.—Porcelain—lustrous colors. 213
- 43 Riedl von Riedenstein, David and Fredrich, Dallwitz, Bohemia.—China services. 213
- 44 Zasche, Joseph, Vienna.—Porcelain. 213
- 45 Count v. Thun, Klosterle, Bohemia.—Porcelain articles of luxury. 213
- 46 Ziegler's Son, Joh. Ant., Kreuzhutte, Bohemia.—Blown plate-glass. 214
- 47 Ziegler's Son, Andreas, Sofienhutte, Bohemia.—Cast looking-glass, glass tiles. 214
- 48 Austrian Glass Foundry Association, Aussig, Bohemia.—Glass bottles. 215
- 49 Schmid, Jos. Ed., Annathal, Bohemia.—Concave glass articles. 215
- 50 Batka, Franz, Prague.—Glassware for chemical purposes. 215
- 51 Franke, Carl, Prague.—Chemists' fixtures. 215

- 52 Umann, John, Tiefenbach, Bohemia.
a Flagons. 215
b Glass articles. 216
- 53 Rasch, Clemens, Meistersdorf, Bohemia.—Concave glass articles. 216
- 54 Lobmeyr, I. and L., Vienna.—Glass articles. 216
- 55 Grohmann & Kessler, Haida, Bohemia.—Glass articles. 216
- 56 Kirschner, Anton, Schaiba, near Haida, Bohemia.—Glass articles. 216
- 57 Dressler, Edward, Gablonz, Bohemia.—Decorative glassware, chandeliers, etc. 216
- 58 Muller, Hermann, Ulrichsthal, Bohemia.—Concave glass articles. 216
- 59 Von Harrach, Count, Neuvelt, Bohemia.—Glass articles. 216
- 60 Ullrich, Heinrich, Vienna.—Glass articles especially adapted for the United States of America. 216
- 61 Hartmann, Moritz, Pribram, Bohemia.—Glass pearls and cylinders. 216
- 62 Wagner, Franz, Meistersdorf, Bohemia.—Glass and bronze articles. 216
- 63 Ziekert, John, Meistersdorf, Bohemia.—Glassware and bronze. 216
- 64 Brunfant, Jules, Vienna.—Glassware. 216
- 65 Schreiber & Neffen, Jos., Vienna.—Glassware. 216
- 66 Palme Son, F. E., Zvecevo, Slavonia.—Glassware. 216
- 67 Stolzle's Sons, Vienna.—Glassware. 216
- 68 Meyr's Nephew, Adolf, near Winterberg, Bohemia.—Glassware. 216

Furniture and Objects of General Use in Construction and in Dwellings.

- 69 Kohn, Jacob and Joseph, Teschen, Bohemia.—Furniture of turned wood. 217
- 70 Dillmann, I., and Fischer, L., Vienna.—Iron furniture. 217
- 71 Rigl, Rudolf, Vienna.—Iron double bed. 217
- 72 Podany, Franz & Mathias, Vienna.—Cabinet articles. 217
- 73 Stein, Carl, Vienna.—Cabinet furniture. 217
- 74 Thonet Bros., Vienna.—Furniture of turned wood. 217
- 75 Hoyer, Joseph, Svetla, Hungary.—Plates of crystal. 218
- 76 Moser, Ludwig, Carlsbad, Bohemia.—Glass articles, painted services. 218
- 77 Lerl & Sons, Gustave, Vienna.—Frames for photographs. 220
- 78 Scheidl, Alois, Vienna.—Gold frames and cornices. 220
- 79 Krauliz, M., Vienna.—Frames for photographs. 220
- 80 Bambula, John, Vienna.—Picture frames. 220
- 81 Sommerschuh, W. I., Prague.—Earthenware stoves and slabs. 222
- 82 Bruder, Ostersetzer, Vienna.—Paper lamp screens. 223

Household Utensils, Woven Goods, Silks, Clothing.

- 83 Kerl's Heir, F. A., Platten, near Carlsbad, Bohemia.—Plated and tinned spoons, boxes, tin articles. 224
- 84 Schuberth, John, Vienna.—Wooden blinds and curtains, movable wooden marquees. 227
- 85 Kien, Martin, Vienna.—Window with easy fastenings. 227
- 86 Csánk & Co., Vienna.—Wood work, blinds, table mats, wall screens. 227

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 87 Beutel, Franz, Vienna.—Wicker work. 229
- 88 Richter & Sons, Ignaz, Niedergrund, Bohemia.—Cotton velvets. 231
- 89 Parma, Joseph, Tichau, Moravia.—Bleached piques. 233
- 90 Garber & Son, John, Vienna.—Cotton and linen bathing gowns, bath towels, table covers. 233
- 91 Berger, Engelbert, Freudenthal, Austria-Silesia.—Damask Turkey red table covers, napkins. 233
- 92 Siegel Senoir, Carl, Vienna.—Bleached linen. 233
- 93 Weiss & Grohmann, Vienna.—Linen and cotton thread. 233

Woven and Felted Goods of Wool, etc.

- 94 Samek Brothers, Brunn.—Woolens. 235
- 95 Huckel's Sons., I., Neutitschein, Moravia.—Hatters' articles, felts. 235
- 96 Cloth Manufacturers' Association, Reichenberg, Bohemia.—Cloths with and without finish. 235
- 97 Bauer Brós., Budapest.—Woolens. 235
- 98 Schmidt & Sons, I. Ph., Reichenberg, Bohemia.—Woolens. 235
- 99 Iakob, Adolf, Reichenberg, Bohemia.—Woolens, military cloth. 235
- 100 Von Bauer, Otto, Brunn.—Woolens. 235
- 101 Sternickel & Gulcher, Biala, Bohemia.—Woolens. 235
- 102 Strzygowski's Sons, Biala, Bohemia.—Woolens. 235
- 103 Siegmund, Wilhelm, Reichenberg.—Woolens. 235
- 104 Koch, Max, Vienna.—Woven long and square shawls. 237
- 105 Lowenfeld, Wolfgang, Vienna.—Shawls. 237
- 106 Hlawatsch & Isbary, Vienna.—Woven shawls. 237
- 107 Frohlich's Sons, Jonas, Vienna.—Woolens, dyed, printed, and embroidered. 238
- 108 Schnabel, Julius, Oravitza, Hungary.—Carpets, rugs, tapestry. 239
- 109 Ginzkey, Ignaz, Maffersdorf, Bohemia.—Carpets, rugs. 239
- 110 Pollak's Son & Co., A., Vienna.—Carpets. 239
- 111 Schweinburg, Gustav, Vienna.—Carpets. 239

- 112 Lowenfeld, Wolfgang, Vienna.—Table covers. 241

Silk and Silk Fabrics.

- 113 Hornbostel & Co., C. G., Vienna.—Silk and half silk goods. 245
- 114 Reichert's Sons, F., Vienna.—Silks. 245
- 115 Frebitsch & Son, S., Vienna.—Silk articles. 245
- 116 Ullmann, I. F., Neudeck, Bohemia.—Silk laces. 247
- 117 Hetzer & Sons, Carl, Vienna.—Silk ribbon and velvet. 248
- 118 Kemperling & Sons, John, Vienna.—Silk ribbons. 248
- 119 Stefsky, Joseph, Stockerau.—Haberdasheries, woolen and silk cords and laces for military purposes. 249

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 120 Bauer Bros., Budapest.—Woolens and clothing. 250
- 121 Bauer, Albert, Humpoletz, Bohemia.—Cloth, velvets, clothing for military purposes. 250
- 122 Keller & Alt, Vienna.—Clothing. 250
- 123 Laube, Rudolf, Prague.—Men's clothing, hunting and traveling dresses. 250
- 124 Mottl Sons, M., Prague.—Men's clothing. 250
- 125 Nerad, John, Prague.—Men's and boys' clothing. 250
- 126 Straschitz, Beermann, Prague.—Men's clothing. 250
- 127 Schwarzmänn & Co., D., Vienna.—Men's clothing, European costumes from coarse to fine. 250
- 128 Thieben, Emanuel, Vienna.—Woven shawls and dressing garments. 250
- 129 Vavruska, Alois, Prague.—Clothing, livery, dresses for military purposes. 250
- 130 Werner, John, Prague.—Men's clothing. 250
- 131 Budan, Joseph, Prague.—Leather gloves. 251
- 132 Eckstein Brothers, Prague.—Kid gloves. 251
- 133 Engelmüller, Ferdinand, Prague.—Leather gloves. 251
- 134 Logemann, F., Vienna.—Leather gloves. 251
- 135 Bencker & Son, M., Prague.—Kid gloves. 251
- 136 Meyer Bros., Vienna.—Leather gloves. 251
- 137 Micka, Karl, Prague.—Leather gloves. 251
- 138 Pilat, Anton, Prague.—Leather gloves. 251
- 139 Pokorny, Karl, Prague.—Leather gloves. 251
- 140 Reichart, Adolf, Vienna.—Shoes. 251
- 141 Repper, Joseph, Vienna.—Leather gloves. 251
- 142 Stiasny, Franz and Max, Vienna.—Leather gloves. 251

Clothing, Jewelry, and Ornaments.

- 143 Dewidels, Simon, Prague.—Kid gloves. 251
- 144 Stoger, Ludwig, Vienna.—Leather gloves. 251
- 145 Hauer, Carl, Brunn.—Leather gloves. 251
- 146 Straub, August, Prague.—Leather gloves. 251
- 147 Frese, Anton, Prague.—Kid gloves. 251
- 148 Steinhilber, Anton, Prague.—Leather gloves. 251
- 149 Bencker, I. U., Prague.—Leather gloves. 251
- 150 Turnwald, Ch., Prague.—Leather gloves. 251
- 151 Braunek, Edward, Vienna.—Leather gloves. 251
- 152 Beutel, Franz, Vienna.—Bath shoes made of plaited rushes. 251
- 153 Aue, Fred., and Kollmann, V. D., Prague.—Kid gloves. 251
- 154 Bossi, Giuseppe, Vienna.—Turkish caps of jute or sheep's wool. 251
- 155 Berg, S., Krakau.—Albumen for the manufacture of gloves, condensed yolks of eggs. 251
- 156 Rott, Franz, Prague.—Leather gloves. 251
- 157 Grunhut, L., Vienna.—Leather gloves. 251
- 158 Suchy, Anton, Prague.—Leather gloves. 251
- 159 Schwarz & Son, Joh., Vienna.—Hatbands. 251
- 160 Vcelicka, August, Prague.—Kid gloves. 251
- 161 Haberkorn, George, Prague.—Leather gloves. 251
- 162 Hamerli, John, Funfkirchen, Hungary.—Leather gloves. 251
- 163 Hoffmann, Joseph, Prague.—Leather gloves. 251
- 164 Irmenbach's successor, Gottlieb, Prague.—Kid gloves. 215
- 165 Laube, Rudolf, Prague.—Bathing hats. 251
- 166 Weiss, Rudolf, Vienna.—Leather gloves. 251
- 167 Kubik, Joh. Nep., Stuhlweissenburg, Hungary.—Leather gloves. 251
- 168 Lowenstein, Adolf R., Vienna.—Fancy shoes. 251
- 169 Kohn & Co., Daniel, Prague.—Shoes of leather and lasting. 251
- 170 Skriván & Son, John, Vienna.—Hats, felts. 251
- 171 Port, Alois, Vienna.—Leather gloves. 251
- 172 Auer, Joseph, Vienna.—Leather gloves. 251
- 173 Kleinschuster, Anton, Marburg, Styria.—Shoes. 251
- 174 Martius, W., Vienna.—Leather gloves. 251
- 175 Korb, Vincenz, Graslitz, Bohemia.—Silk laces, lace articles. 252
- 176 Czerminska, Inocenta, Wisniowczyk, Galicia.—Embroidery. 252
- 177 Egerer, Anton, Vienna.—Articles embroidered with chenille. 252
- 178 Richter, Edward A., Vienna.—Variegated embroidery, working materials requisite for the same. 252
- 179 Schnabl, Joseph, Gossengrun, Bohemia.—Laces, fichus, handkerchiefs, and fan decorations of lace. 252
- 180 Seidl, Joseph, Teplitz, Bohemia.—Haberdasheries. 252
- 181 Lowenfeld, Wolfgang, Vienna.—Woolen, silk, and enamel cloth embroidery. 252
- 182 Dorner, Emilie, Bosing, Hungary.—Laces and embroideries. 252
- 183 Erlbeck, Anton, Gossengrun.—Laces, fan decorations, handkerchiefs, and lace fichus. 252
- 184 Horner, Anton, Gossengrun, Bohemia.—Laces, lace fichus, and fan decorations. 252
- 185 Schmidl & Sons, W., Vienna.—Haberdashery, trimmings, silk and woolen braids. 252
- 186 Fritsch, Joseph, Gossengrun.—Laces, handkerchiefs, fichus, and fan decorations of lace. 252
- 187 Lapaine, Caroline, Idria.—Bobbinets. 252
- 188 Lindner, Edward, Gottesgab, Bohemia.—Laces, lace fichus, handkerchiefs, and shawls. 252
- 189 Metzner, Bernhard, Graslitz, Bohemia.—Laces, handkerchiefs, and fan decorations. 252
- 190 Stramitzer, I., Vienna.—Point gaze tape laces. 252
- 191 Menzel, W. E., Teplitz, Bohemia.—Garnets, genuine and imitation stones (pierres de strasse). 253
- 192 Reif, Joseph, Prague.—Jewelry of precious stones. 253
- 193 Goldschmidt's Sons, Michael, Prague.—Gold and silver ornaments. 253
- 194 Steiner & Kolliner, Prague.—Garnet, gold and silver jewelry. 253
- 195 Fric, V., Prague.—Imitation of precious stones. 253
- 196 Markowitsch & Scheid, Vienna.—Silver trinkets. 253
- 197 Neustadtl, M. H., Prague.—Garnet jewelry. 253
- 198 Kleeberg, Anton, Vienna.—Gold, silver, and metal articles. 253
- 199 Bolzani & Fussl, Vienna.—Gold chains. 253
- 200 Bergmann, Franz, Gablonz.—Imitation gems. 253
- 201 Adametz, Joseph, Prague, Bohemia.—Bohemian garnet goods in gold setting. 253
- 202 Rodeck Brothers, Vienna.—Jewelry. 253
- 203 De Brunfaut, Jules, Vienna.—Glass jewelry. 253
- 204 Schondorfer, Andreas, Vienna.—Mother-of-pearl trinkets. 253
- 205 Kersch, Moritz, Prague.—Garnet articles. 253
- 206 Kerlitzky & Son, Joseph, Prague.—Garnet jewelry articles. 253

Jewelry, Ornaments, Fancy Goods.

- 207 Ulbrich, Franz, Ober-Kukan, near Gablonz.—Imitation of precious stones. 253
- 208 Krauliz, M., Vienna.—Jewelry. 253
- 209 Hofrichter's Son, Joseph, Reichenau, near Gablonz, Bohemia.
a Imitation precious stones. 253
b Papier-maché boxes. 254
- 210 De Brunfaut, Jules, Vienna.—Toilet articles. 254
- 211 Rodeck Bros., Vienna.—Bronze articles. 254
- 212 Krauliz, M., Vienna.—Bronze articles. 254
- 213 Schadelbauer, Vincenz, Vienna.—Mother-of-pearl buttons. 254
- 214 Brauneis, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 215 Bock, Edward, Vienna.—Mother-of-pearl buttons and articles. 254
- 216 Baudissin, Countess Pauline, Vienna.—Artificial flowers. 254
- 217 Turners' Sample Office, Vienna.—Cork articles, tobacco pipe tube, and amber cigar holders. 254
- 218 Gallas, Joseph, Vienna.—Boxes of pasteboard, trick goods, mocking glasses, placards with movable type. 254
- 219 Gabriel, Edward, Vienna.—Mother-of-pearl buttons. 254
- 220 Grau, Carl, Vienna.—Fans. 254
- 221 Iawanski, Franz, Vienna.—Turners' articles and smoking requisites. 254
- 222 Iauernig, O. B., Vienna.—Mother-of-pearl buttons and articles. 254
- 223 Iaruschka, Joseph, Vienna.—Mother-of-pearl buttons. 254
- 224 Iank, Leopold, Vienna.—Mother-of-pearl buttons. 254
- 225 Fleischmann, Wm., Vienna.—Mother-of-pearl buttons and articles. 254
- 226 Hieke, Augustine, Tyssa, near Bodenbach, Bohemia.—Horn and metal buttons. 254
- 227 Lux, K., Vienna.—Bronze articles. 254
- 228 Bergman, Franz, Vienna.—Bronze articles. 254
- 229 Kittig, Jos., Vienna.—Bronze goods. 254
- 230 Neuber, Raphael, Vienna.—Bronze goods. 254
- 231 Hellmich, F. A. Eidam, Wolfersdorf, Bohemia.—Glass, pearls, bone, ivory, horn, and tortoise-shell buttons, real and imitation. 254
- 232 Heller's Sons, Balduin, Teplitz, Bohemia.—Metal buttons and trinkets. 254
- 233 Hynek, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 234 Hiess, Franz, Vienna.—Turners' articles, meerschaum and amber. 254
- 235 Horn, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 236 Kautsky, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 237 Kemperling, Hermann, Vienna.—Turners' articles, pipes, cigar holders, canes. 254
- 238 Keiss, Peter, Vienna.—Meerschaum and amber pipes, cigar holders, ivory articles with fittings. 254
- 239 Kibitz & Sons, George, Pilsen, Bohemia.—Smoking requisites. 254
- 240 Kock, F., Vienna.—Mother-of-pearl buttons and articles. 254
- 241 Krehan, Ignaz, Vienna.—Mother-of-pearl buttons. 254
- 242 Brandl, P., Vienna.—Mother-of-pearl buttons and articles. 254
- 243 Kuzel, John, and Jankowsky, C., Vienna.—Turners' articles, inkstand, cigar holder, ash bowls, watch holder, candle screens. 254
- 244 Kunschke, Florian, Gaudenzdorf, near Vienna.—Mother-of-pearl buttons. 245
- 245 Lang & Co., Joseph, Vienna.—Meerschaum articles, amber. 254
- 246 Ertlbauer, Franz, Vienna.—Mother-of-pearl buttons. 254
- 247 Fischer, Joseph, Vienna.—Meerschaum pipes. 254
- 248 Umann, John, Tiefenbach, Bohemia.—Paper weights. 254
- 249 Lerl & Sons, Gustave, Vienna.—Bronze articles, trinkets, toys. 254
- 250 Zekert, John, Meistersdorf Bohemia.—Bronze. 254
- 251 Wagner, Franz, Meistersdorf.—Bronze articles. 254
- 252 Lederer, K., Gablonz, Bohemia.—Glass trinkets. 254
- 253 Lustig & Vidor, Vienna.—Gold and mosaic articles, bracelets, medallions, brooches, ear rings, chains, match boxes. 254
- 254 Hartmann, L. and Eidam, Vienna.—Turners' articles, smoking requisites made of meerschaum and amber. 254
- 255 Hawel, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 256 Lukarch, I., Vienna.—Mother-of-pearl fancies. 254
- 257 Lowenthal, Edward, Gablonz, Bohemia.—Glass trinkets. 254
- 258 Mayr, Alois, Vienna.—Fans. 254
- 259 Moeslein, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 260 Mantel, E., Vienna.—Mother-of-pearl buttons and articles. 254
- 261 Mahr, F., Vienna.—Mother-of-pearl buttons and articles. 254
- 262 Naumann, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 263 Neindeifel, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 264 Obershaus, Jos., Vienna.—Mother-of-pearl buttons and articles. 254
- 265 Schon, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 266 Schneider, Wenzel, Prague.—Necessaries for the toilet, threading machines. 254
- 267 Sittig, Joseph, Vienna.—Horn buttons. 254
- 268 Luksch, Ignaz, Vienna.—Leather and bronze fancy articles. 254
- 269 Kirschner, Anton, Schaiba, near Haida, Bohemia.—Glass and bronze articles. 254
- 270 Bachnik, F., Vienna.—Mother-of-pearl buttons and articles. 254

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Clothing, Ornaments, Fancy Goods, Stationery.

- 271 Coffani, Maria, Vienna.—Parasols, fans, hats, and trinkets, made of straw. 254
- 272 Bauer & Pokorny, Vienna.—Meerschäum pipes. 254
- 273 Eckelt, Carl, Vienna.—Turners' work; smoking requisites. 254
- 274 Osterritter, Joseph, Vienna.—Fans of tortoise-shell, ivory, feathers, silk, wood, and leather. 254
- 275 Polaczek, A., Vienna.—Mother-of-pearl buttons and articles. 254
- 276 Preis, I., Vienna.—Mother-of-pearl buttons and articles. 254
- 277 Ptacnik, Carl, Vienna.—Mother-of-pearl buttons. 254
- 278 Puschner, Franz Anton, Tyssa, near Bodenbach, Bohemia.—Metal buttons, brooches, sets of ear-rings, emblems, medals, decorative buckles. 254
- 279 Schwan, Wilhelm, Willendorf.—Mother-of-pearl buttons. 254
- 280 Schwarz, Ig., Vienna.—Mother-of-pearl buttons and articles. 254
- 281 Schwarz, W., Vienna.—Mother-of-pearl buttons and articles. 254
- 282 Witek, Jos., Vienna.—Mother-of-pearl buttons. 254
- 283 Witek, Adalbert, Vienna.—Mother-of-pearl buttons. 254
- 284 Wintes, W., Vienna.—Mother-of-pearl buttons and articles. 254
- 285 Steindl, Carl, Vienna.—Mother-of-pearl buttons. 254
- 286 Blazincic & Sons, John, Vienna.—Haberdashery. 254
- 287 Bintl, Alois, Vienna.—Mother-of-pearl buttons. 254
- 288 Tomek, Wenzel, Meidling, near Vienna.—Mother-of-pearl buttons, turners' articles. 254
- 289 Sohrada, Anton, Vienna.—Turners' articles. 254
- 290 Trebitsch, Arnold, Vienna.—Articles of meerschäum and amber. 254
- 291 Unger, Franz, Vienna.—Smoking requisites. 254
- 292 Wacha, Joseph, Vienna.—Mother-of-pearl buttons. 254
- 293 Danberger, George, Vienna.—Bronze ware, frames for photographs, toilet looking glass, cigar holders, inkstands, match boxes. 254
- 294 Walter, George, Vienna.—Turners' articles, smoking requisites, amber cigar holders. 254
- 295 Bresch, Iac, Vienna.—Mother-of-pearl buttons and articles. 254
- 296 Dworak, Alois, Vienna.—Mother-of-pearl buttons. 254
- 297 Bechmann, A. F., Vienna.—Bronze-ware. 254
- 298 Beihl, Franz, Vienna.—Bronze-ware. 254
- 299 Frank, Joseph, Vienna.—Bronze-ware. 254
- 300 Dzudzinski & Hanusch, Vienna.—Bronze articles. 254
- 301 Bohm, Anton, Vienna.—Bronze-ware. 254
- 302 Bohm, Ludwig, Vienna.—Bronze-ware. 425
- 303 Ferd. Zambach's Successors, Vienna.—Mother-of-pearl buttons. 254
- 304 Schweizer, Ignaz, Vienna.—Thick shelled nut and horn buttons. 254
- 305 Neuber, Raphael, Vienna.—Bronze articles. 254
- 306 Wertheimer, Joseph, Vienna.—Fans. 254
- 307 Wielander, Peter, Vienna.—Mother-of-pearl buttons. 254
- 308 Bambula, John, Vienna.—Bronze goods, albums, writing portfolios, belts. 254
- 309 Enders, Felix, Vienna.—Leather articles, trinkets. 255
- 310 Unger, Franz, Vienna.—Portemonnaie, frames for manufacture of leather fancy goods. 255
- 311 Klein Sons, Theodore, Vienna.—Leather fancy goods. 255
- 312 Wurth, Gabriel, Vienna.—Leather articles, trinkets. 255
- 313 Martens, C., and Baumer, Vienna.—Imitation leather articles. 255
- 314 Wirth, C. F., Vienna.—Leather articles, trinkets. 255
- 315 Seewald, Michael, Vienna.—Leather ware and trinkets. 255
- 316 Rodeck Bros., Vienna.—Leather articles. 255
- 317 Osterritter, Joseph, Vienna.—Leather articles. 255
- 318 Mayr, Alois, Vienna.—Leather articles. 255
- 319 Franke, Julius, Vienna.—Leather articles. 255
- 320 Bloch & Sons, E., Brunn.—Cart-ridge pouches. 255

Paper, Blank Books, Stationery.

- 321 Fialkowski Bros. & Twerdy, Bielitz, Austria-Silesia.
- a* Writing paper. 259
- b* Printing paper. 260
- 322 Eichmann & Co., Arnau, near Prague.—Samples of paper. 259
- 323 Opitz & Son, Carl, Teplitz, Bohemia.
- a* Paper. 259
- b* Pasteboard. 262
- 324 Piette, P., Bubenc, Bohemia.
- a* Artificial flower paper. 259
- b* Paper hangings, paper for blinds. 264
- 325 Knepper, W., Vienna.
- a* Cigarette paper. 260
- b* Fancy paper. 264
- 326 Schloglmühl Paper Factory, Vienna.—Paper rolls for printing machines. 260
- 327 Schoffel, Anton, Reichenau, Bohemia.—Papier-maché boxes. 262
- 328 Wesely, Veit., Vienna.—Boxes. 262
- 329 Noa, Theodore, Vienna.—Paste-board articles, fancy bonbon baskets. 262
- 330 Schnabl & Co., Jacob, Vienna.
- a* Paper cigar holders. 263
- b* Paper for cigarettes. 264
- 331 Bruder Ostersetzer, Vienna.—Paper laces. 264

Manufactures, Art, Machinery.

Weapons, etc.

- 332 Fuckert, Gustave, Weipert.
a Military guns and revolvers. 265
b Hunting guns and revolvers. 269
- 333 Percussion Caps, Cartridge, and Breech Ring Factory, Prague.—Percussion caps, cartridges, and breech rings. 265

Medicine, Surgery, Prothesis.

- 334 Wilhelm & Co., Franz, Vienna.—
 Drugs. 272
- 335 Wartpatrikoff Bros., Vienna.—
 Insect powder. 272
- 336 Pollak, Jacques, Vienna.—
 Ether. 272
- 337 Zacherl, John, Vienna.—Insect powder and tinctures. 272
- 338 Hamerli, John, Funfkirchen, Hungary.—Leather trusses. 276
- 339 Berghammer, Fr., Vienna.—Set of artificial teeth. 277
- 340 Perl, Joseph, Klausenburg, Hungary.—Teeth, sets of teeth. 277
- 341 Zsigmondy, Adolf, Vienna.—
 Teeth. 277

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 342 Laferls, Franz, Vienna.—Cutting tools. 280
- 343 Wertheim, Franz, Vienna.—Complete representation of the Austrian tool manufacture. 280
- 344 Schneider, Wenzel, Prague.—Fine penknives. 281
- 345 Rigl, Rudolf, Vienna.
a Wood-cutting apparatus. 280
b Knife and fork cleaner. 281
- 346 Winkler, Alois, Vienna.—Cast zinc articles, plates, emblems, letters, and coat of arms. 283
- 347 Winkler, Michael, Vienna.—Cast metal signs and letters. 283
- 348 "Moravia," Vienna.—Nails, screws. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 349 Seidl, Joseph, Teplitz, Bohemia.—
 India rubber articles. 285
- 350 Schneck & Kohnberger, Vienna.—
 India rubber goods. 285
- 351 Hausmann, Wilhelm, Reichenberg.—Rope articles, twine, cords, girths. 287
- 352 Kohl, August, Vienna.
a Hemp hose, mill straps for mills. 287
b Fire buckets for mills. 289

Carriages, Vehicles, and Accessories.

- 353 Lohner & Co., Jacob, Vienna.—
 Phaeton carriages. 292
- 354 Harnisch, Gustave, Neusohl, Hungary.—Carriage wheels and raw materials. 293
- 355 Rigl, Rudolph, Vienna.—Velocipedes. 293
- 356 Armbruster, Sebastian, Vienna.—
 Landeau coach. 293
- 357 Bloch & Sons, E., Brunn.—
 leather saddle cloths. 296

Engraving and Lithography.

- 358 Winkler, Alois, Vienna.—
 Oleographs. 424

Ceramic Decorations, Mosaics, etc.

- 359 Steinmetz, Franz, Petronberd, Illyria.—Inlaid work and veneer. 452
- 360 Egger, I. B., Villach, Karnten.—
 Inlaid work and veneer. 452

Machines for Printing, Making Books, Paper Working, etc.

- 361 Wuste, F., Vienna.—Cylinder coverings. 543

Arboriculture and Forest Products.

- 362 Frankl, J. G. & L., Vienna.—Wood specimens for the manufacture of furniture. 601
- 363 Montel, L. S., Vienna.—Refined camphor. 603

Water Animals, Fish Culture and Apparatus.

- 364 Nachtmann, Jacob, Tannwald, Bohemia.—Chamber leech aquariums. 640

Animal and Vegetable Products.

- 365 Zackerl, John, Vienna.—Cleaned sponges. 650
- 366 Martins, W., Vienna.—Skins. 652
- 367 Port, Alois, Vienna.—Skins. 652
- 368 Kubik, Joh., Nep., Stuhlweissenburg, Hungary.—Lamb skins. 652
- 369 Awart's Sons, C. H., Vienna.—
 Glove leather. 652
- 370 Ujhely & Co., H., Stockerau.—
 Wax. 654
- 371 Kurzhalss, Julius, Tetschen-on-Elbe.—Fruit syrups. 659
- 372 Schadek, Franz I., Vienna.—
 Bons. 661

SWITZERLAND.

(North of Nave, Columns 52 to 55.)

Chemical Manufactures, Ceramics, Furniture, Woven Goods.

Chemical Manufactures.

- 1 Guyot-Lupold, A., Locle, Ct. Neuchâtel.—Chemical products, artificial black diamond, diamantine, powder of rubies, enamels for jewelry. 200
- 2 Ruffner-Casper, Nicolas, Samaden, Ct. Graubünden.—Artificially crystalized alumina, corundum, sapphire, ruby. 200
- 3 Zæslein & Müller, Basle.—Argal, silk waste, and fabrics of silk waste. 200
- 4 Amblet & Poncet, Geneva.—Oil for watches and instruments of precision. 201
- 5 Brunnschweiler, Traugott, St. Gallen.—Caseum for calico printing, caseum-glue for cold glueing. 201
- 6 Vaucher, L., Peseux, near Neuchâtel.—Animal oil for chronometers and fine watches. 201
- 7 Bindschedler & Busch, Basle.—Raw materials for the manufacture of dyes, aniline dyes, artificial alizarine. 202
- 8 Brunnschweiler & Son, St. Gallen.—Printing inks, inks for Morse & Hughes' apparatus, extracts of ink in powder. 202
- 9 Durand & Huguenin, L., Basle.—Naphthaline, resorcine, fluoresceine, cosine, phthaline and solutions, sefranine, galleine, ceruleine, steam blue, etc. 202
- 10 Bühler, Emile, Neuchâtel.—Hair regenerator, pomade, balsam, tooth-water, quinine-water. 203

Ceramics—Pottery, Porcelain, Glass, etc.

- 11 Collin, Ch., Derendingen, Ct. Solothurn.—Watch glasses. 214

Furniture, etc.

- 12 Böhme, F., & Co., Winterthur, Ct. Zurich.—Gilt and polished cornices and frames for pictures, mirrors, photographs. 220

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 13 Billeter, C. G., Zurich.—Singed cotton threads, unbleached cotton sewing thread, cotton leash threads. 230
- 14 Brunner, A., Männedorf, Ct. Zurich.—White and colored bed-covers. 230
- 15 Gujer-Brunner, Uster, Ct. Zurich.—White and colored tricot bed-covers and table-cloths. 230
- 16 Oetiker, M. R., Männedorf, Ct. Zurich.—White and colored cotton bed-covers and table-cloths. 230

- 17 Schlaepfer, T. U., Waldstatt, Ct. Appenzell, Inner Rhodes.—Muslin. 230
- 18 Fierz, Henri, Zurich.—Cotton goods. 231
- 19 Wallenstadt Fancy Cotton Goods Mills, Wallenstadt, Ct. St. Gallen.—Fancy cotton goods. 231
- 20 Fierz, Henri, Zurich.—Turkey-red printed handkerchiefs, cachemere shawls, door-curtains, chintz. 232
- 21 Hanhart-Solivo, J., Dietikon, Ct. Zurich.—Cambrics, handkerchiefs, shawls, chintzes. 232
- 22 Azmoos Weaving Mills, Azmoos, Ct. St. Gallen.—Figured cotton goods. 232
- 23 Schneider, C. F., Dättlikon, Ct. Zurich.—Lint for hospitals, colored wadding for jewelry. 233

Woven and Felted Goods of Wool, etc.

- 24 Munzinger, Conrad, Olten, Ct. Solothurn.—Felt of wool and cotton for paper mills, cylinder-cloth. 235
- 25 Siegenthaler, Sl., Enggistein, near Worb, Ct. Berne.—Boots and shoes of felt with and without wooden soles, felt soles, felt tablets for watch-makers, filtering bags, felt trimmings. 235
- 26 Ernst, Ferdinand, Winterthur, Ct. Zurich.—Goods of wool and mixtures of wool. 238
- 27 Schnyder, J. J., Wädensweil, Ct. Zurich.—Worsted horse-hair and fibre for mattresses and upholstery, horse-tails, bristles. 240

Silk and Silk Fabrics.

- 28 Baumann, senior, & Co., Zurich.—Silks. 245
- 29 Baumann & Streuli, Horgen, Ct. Zurich.—Silks. 245
- 30 Dufour & Co., Thal, Ct. St. Gallen.—Silk bolting-cloth, silk grit-gauze. 245
- 31 Egli & Sennhauser, Zurich.—Silk bolting-cloth, middlings purifiers. 245
- 32 Frey-Feer, J., & Co., Aargau, Ct. Aargau.—Silk ribbons, faille, cord-edged taffetas, sarsenets, listons, satins. 245
- 33 Heidegger, Wegmann, & Co., Seefeld, Zurich.—Silk bolting-cloth. 245
- 34 Homberger, Gebrüder, Wetzikon, Ct. Zurich.—Silk bolting-cloth. 243
- 35 Jansen, Bodek, & Hertz, Riesbach, near Zurich.—Silks and satins. 245
- 36 Adlischweil Silk Goods Factory, Adlischweil, near Zurich.—Silks. 245

Silks, Clothing, Jewelry, Fancy Goods, Stationery, Weapons.

- 37 Winterthur Silk Goods Factory, Winterthur, Ct. Zurich.—Umbrella silks. 245
- 38 Meyer, Gebrüder, Zurich.—Swiss silk bolting-cloth. 245
- 39 Reiff-Huber, Zurich.—Silk bolting-cloth. 245
- 40 Rüttschi, S., & Co., Zurich.—Silks and satins. 245
- 41 Ryffel & Co., Stäfa and Zurich.—Silks. 245
- 42 Schärer, Emil, & Co., Zurich.—Silks. 245
- 43 Schröder, Wilhelm, & Co., Zurich and Crefeld, Germany.—Silks. 245
- 44 Schwarzenbach, Landis J., Thalweil, near Zurich.—Silks. 245
- 45 Stapfer, Joh., Sons, Horgen, Ct. Zurich.—Silks. 245
- 46 Stunzi & Sons, Horgen, Ct. Zurich.—Silks and satins. 245

Clothing, Jewelry, etc.

- 47 Blumer & Wild, St. Gallen.—Hosiery, ladies' fancy articles. 250
- 48 Bourquin, C. F., Cormondrèche, near Neuchâtel.—Wool hosiery, jackets, and waistcoats. 250
- 49 End-Ulmi, Ali., Lucerne.—Knitted under-garments. 250
- 50 Hess, Gebr., Amrisweil, Ct. Thurgau.—Colored shirts and over-shirts. 250
- 51 Huggenberger, U., Frauenfeld, Ct. Thurgau.—Hosiery. 250
- 52 Meyer-Wäspi & Co., Altstetten, near Zurich.—Knitted under-garments. 250
- 53 Wiki, B., Lucerne.—Gentlemen's clothing. 250
- 54 Bell, August, Kriens, near Lucerne.—Crinoline braids. 251
- 55 Chiesa Bros., Locarno, Ct. de Tessin.—Braids and straw hats, canton Tessin specialty. 251
- 56 Eich & Co., Lenzburg, Ct. Aargau.—Horse-hair braids, straw-plaitings, cotton tress-work, borderings, hair-cloth. 251
- 57 Indermühle, E. Th., Berne.—Straw hats. 251
- 58 Isler, Aloyse, & Co., Wildeg, Ct. Aargau.—Hair and cotton plaits, fancy goods of hair, straw, cotton, and silk for hats and bonnets. 251
- 59 Isler, Jacob, & Co., Wohlen, Ct. Aargau.—Straw goods. 251
- 60 Walser, Conrad, Wohlen, Ct. Aargau.—Straw hats, plaits, and fancy articles of straw, crinoline, cotton, and manilla hemp, tissues of straw, silk, and other materials for fancy boxes, spartry, embroidery, and ornaments for bonnets. 251
- 61 Alder Bros., Herisau, Ct. Appenzell, Inner Rhodes.—Hand and mechanical embroideries. 252
- 62 Alder & Meyer, Herisau, Ct. Appenzell, Inner Rhodes.—Embroidered trimmings. 252
- 63 Baerlocher-Custer, Rheineck, Ct. St. Gallen.—Embroidery, lace curtains, tidies, bed-covers, pillow-case covers. 252
- 64 Basquin, Hector, & Schweizer, St. Gallen.—Machine embroideries. 252

- 65 Bion & Tschumper, St. Gallen.—Mechanical embroideries. 252
- 66 Fisch Bros., Buhler, Ct. Appenzell, Inner Rhodes.—Mechanical embroideries. 252
- 67 Göldy, A., & Co., St. Gallen.—Mechanical embroideries, Hamburg edgings and insertions. 252
- 68 Hirschfeld Bros. & Co., St. Gallen.—Swiss lace curtains. 252
- 69 Iklé Bros., St. Gallen.—Mechanical embroideries. 252
- 70 Locher Bros., Speicher, Ct. Appenzell, Inner Rhodes.—Mechanical embroideries on silk. 252
- 71 Wülflinger Machine Embroidery Establishment, near Winterthur, Ct. Zurich.—Colored embroidery by machinery, Hamburg edgings. 252
- 72 Scheitlin & Widmer, St. Gallen.—Mechanical embroideries. 252
- 73 Stäheli-Wild, C., St. Gallen.—Hand and mechanical embroideries. 252
- 74 Steiger & Co., Herisau, Ct. Appenzell, Inner Rhodes.—Mechanical embroideries, lace curtains. 252
- 75 Strauss, D., & Co., St. Gallen.—Lace curtains, drop laces, embroideries. 252
- 76 Sturzenegger & Rutz, Trogen, Ct. Appenzell, Inner Rhodes.—Cravats, edgings. 252
- 77 Sutter-Dörig, R., Appenzell.—Hand and machine embroidery. 252
- 78 Tobler, Ulr., & A., Rheineck and Thal, Ct. St. Gallen.—Machine embroidery. 252
- 79 Zähler & Schiess, Herisau, Ct. Appenzell, Inner Rhodes.—Hamburg edgings and insertions. 252
- 80 Zellweger, J. C., Trogen, Ct. Appenzell, Inner Rhodes.—Mechanical embroideries. 252
- 81 Drawing School of the Board of Trade, St. Gallen.—Embroideries executed from designs of the drawing school. 252
- 82 Urech, E., Herisau, Ct. Appenzell, Inner Rhodes.—Mechanical embroidery. 252
- 83 Petit-Pierre & Bryson, Geneva.—Jewelry. 253
- 84 Scharneck & Co., Geneva.—Jewelry, drawings. 253
- 85 Jaccard, Eugène, St. Croix, Ct. de Vaud.—Plate engraved with flowers, ornaments, and devices relating to the Centennial. 254
- 86 Walter von Rohr, A., Mümliswyl, Ct. Solothurn.—Combs. 254

Paper, Blank Books, Stationery.

- 87 Schubert, Friedrich, Zurich.—Album with photographs, bindings. 261
- 88 Müller, Johs., Schaffhausen.—German, French, English, and Spanish playing cards, railway tickets. 262

Weapons, etc.

- 89 Swiss Manufacturing Co., Neuhausen, near Schaffhausen.—Vetterli-system, infantry and target rifles, blank cartridges. 265

Medicine, Surgical Appliances, Hardware.

Medicine, Surgery, Prothesis.

- 90 Durieu, Oettli, & Co., Vevey, Ct. Vaud.—Milk-powder. 273
- 91 Gerber & Co., Thun, Ct. Berne.—Condensed milk, children's food, medical condensed milk. 273
- 92 Lapp, C., Freiburg.—Food for children, condensed milk. 273
- 93 Naumann-Burkhardt, H., Basle.—Extract honey, syrup, and flour of meat. 273
- 94 Nestlé, Henry, Vevey, Ct. Vaud.—Milk food or lacteous farina. 273
- 95 International Bandage-shiff Factory, Schaffhausen.—Dressings, lint, appliances for the dressing of wounds, pharmaceutical apparatus. 276

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 96 Spillmann, Heinrich, Unterstrass, near Zurich.—Engineering tools. 280
- 97 Schneider, C. F., Geneva.—Complicated pocket-knives. 280
- 98 Bürgin, Gebr., Schaffhausen.—Up-holsterers' nails. 280

Fabrics of Vegetable, Animal, or Mineral Materials.

- 99 Bally & Schmitter, Aarau, Ct. Aargau.—Elastic webs for boots. 285

BELGIUM.

(North of Nave, Columns 54 to 59.)

Chemical Manufactures, Ceramics, Glass.

Chemical Manufactures.

- 1 Hemptinne, A. de, Son, Molenbeek, St. Jean, near Brussels.—Plan of apparatus for manufacturing sulphuric acid. 200
- 2 Desespringalle, A., Son, Brussels.—Chemicals for medicine, the arts, and painting. 200
- 3 Meeus, M. & J., Antwerp.—Refined sulphur. 200
- 4 Solvay & Co., Couillet, near Charleroi.—Chemicals, soda-salt. 200
- 5 Vandervelde, J. S., Lebbeke, East Flanders.—Powder for the removal of the wheat disease. 200
- 6 Des Cressonnières (widow) & Son, Molenbeek, St. Jean, near Brussels.—Toilet soap. 201
- 7 Goossens & Voets, Wavre (Brabant).—Toilet soaps. 201
- 8 Staes, Sproelants, Termonde, East Flanders.—Linseed, rape-seed, hemp-seed, cotton, and other oils. 201
- 9 Botelberge, Gustave, & Co., Melle, near Ghent, East Flanders.—Ultramarine. 202
- 10 Gilkinet, C. J., Ensival, near Verviers.—*Cache-epoutil* or special ink to point out the defects on cloth and dye stuffs. 202
- 11 Lummerzheim, M. H., & Co., Wondelgem, near Ghent, East Flanders.—Bituminous and re-asphaltic roof and ship sheathing paper, lampblack. 202
- 12 Offergeld Bros., Forest, near Brussels.—Red, brown, and chestnut iron paint. 202
- 13 Planche, Edouard, Son, Laeken, near Brussels.—Writing ink. 202
- 14 Planche, Melchior, Ixelles, near Brussels.—Writing ink. 202
- 15 Singer, Max, Tournai (Hainaut).—Aniline products for dyes extracted from coal-tar, etc. 202

- 16 White Lead and Iron Paint Joint Stock Co., Anderghem, near Brussels.—White lead, iron paint, mastics. 202
- 17 Van der Velden, Leopold, Liège.—Writing, glossing, and indelible ink, liquid glue, etc. 202
- 18 Van Laer, Guillaum, Verviers.—Dyers' practical guide, mordant processes. 203
- 19 Marbaix, Auguste de, Antwerp.—Aromatic liquor, Anvers water, essential oil, caraway essence, cedar essence, Florentine iris and oil of cloves. 203
- 20 Cooppal & Co., Wetteren, East Flanders.—Charcoal, sulphur, powder and cartridges. 204

Ceramics—Pottery, Porcelain, Glass, etc.

- 21 De Koninck Bros., Diest (Brabant).—Artistic pottery. 206
- 22 Henroz, Camille, Floreffe (Namur).—Refractory and silex products, artificial grit stone. 207
- 23 Seilles lez Andenne and Bouffoulx Joint Stock Co. of Refractory Products and Plastic Clay, Seilles, near Andenne, Province of Liège.—Burnt refractory earthenware, brick for gas furnaces, etc., gas retorts, refractory plastic clay. 207
- 24 Barth, Désiré, Andennelle, near Andenne, Province of Namur.—Clay pipes. 210
- 25 Wingender Bros., Chokier, near Liège.—White and colored clay pipes. 210
- 26 Floreffe Co., Floreffe, near Namur.—Plate glass for windows. 214
- 27 Andris, Lambert, & Co., Marchienne-au-Pont, near Charleroi (Hainaut).—White window and heavy muslin glass. 214
- 28 Baudoux & Co., Charleroi.—White and colored window and unpolished and corrugated muslin glass, with variegated rosettes engraved and cut. 214

Glass, Furniture, Household Appliances, Woven Goods.

- 29 Baudoux, Eugene & Jonet, Lodelinsart.—Colored and fancy window glass. 214
- 30 Bennert & Bivort, Jumet, near Charleroi.—Window glass. 214
- 31 Bougard, A., Le Brun, H., & Co., Roux, near Charleroi.—Window glass. 214
- 32 Dorlodot, L. de, & Co., Lodelinsart.—Unpolished and corrugated window glass, greenhouse, cathedral, and stained glass, old glass imitation. 214
- 33 Looper, de Haidin, & Co., Courcelles.—Window glass. 214
- 34 Dessent, J., & Bros., Jumet.—Window glass. 214
- 35 Fourcault-Frison, A., & Co., Dampremy, near Charleroi.—Window glass. 214
- 36 Hans, Octave, & Co., Jumet, near Charleroi.—Window glass. 214
- 37 Lambert, Casimir, Son, Charleroi.—Window glass. 214
- 38 Lambert, L., & Co., Hamendes Glass works, Jumet.—Window glass. 214
- 39 Leurant, Emile, Jumet (Heigne), near Charleroi.—Glass cylinder. 214
- 40 Mondron, Leon, Lodelinsart, near Charleroi.—Window glass. 214
- 41 Monnoyer, J., & Son, Dampremy, near Charleroi.—Window glass. 214
- 42 Morel, Alphonse, Lodelinsart, near Charleroi.—Window glass. 214
- 43 Schmidt, A., & Co., L'Alliance Glass Works, Jumet (Brulotte), near Charleroi.—Window and fluted glass. 214
- 44 Schmidt, Devillez, & Co., Dampremy, near Charleroi.—Window glass. 214
- 45 Glass Works Joint Stock Co., Charleroi.—Window glass. 214
- 46 Plate Glass Manufacturing Joint Stock Co., Courcelles, near Charleroi.—Clean polished and plated glass. 214
- 47 Hainaut Glass Manufacturing Joint Stock Co., Roux, near Charleroi.—Plate-glass for windows, silvered glass, samples of plate-glass at different stages of manufacture. 214
- 48 Glassware and Plate Glass Manufacturing Joint Stock Co., Brussels.—Framed plated and unplated mirrors. 214
- 49 Bougart, A., Manage (Hainaut).—Crystals. 216
- 50 Boussu, Familleureux et Blanc Misseron Glass Works Joint Stock Co., Boussu, near Mons (Hainaut).—Crystals and half crystals, dinner service, and articles for lighting. 216
- 56 Zech, H., Malines.—Ebony bureau, arm-chair, and book-case. 217
- 57 Boucneau, Leon, Schaerbeek, near Brussels.—Marble mantel-piece, Belgian mosaic marble panels for dining-room decoration, brick pavement and Belgian mosaic marble table. 217
- 58 Guyaux Bros., Bouffoulx, near Charleroi.—Black marble, St. Anne mantel-piece. 217
- 59 Lintelo, A., Brussels.—Clocks and marble slabs. 217
- 60 Parmentier, Gosset, & Co., Sivry (Hainaut).—Marble mantel-pieces with vases and clocks. 217
- 61 Tainsy, F., Brussels.—Marble mantel-pieces. 217
- 62 Brodure, Mathieu, Spa.—Painted, varnished, and gilt wooden-work. 219
- 63 Bronfort Bros., Spa.—Painted and ornamented wooden boxes, etc. 219
- 64 Debrus, Leclair (widow), Spa.—Painted and ornamented wooden boxes, etc. 219
- 65 Debrus, Willem Alexandre, Spa.—Wooden boxes, etc. 219
- 66 Krins, E., Spa.—Wood carvings. 219
- 67 Van Ginderdeuren, Brussels.—Wood carvings, furniture. 219
- 68 Costermans, Jean, Brussels.—Similar hearth of the Flemish renaissance. 222
- 69 Miedel, Dieudonné, Sombreffe, near Gembloux, Province of Namur.—A brick layer ventilator for chimneys and coal-mine pits. 222
- 70 Serta, G. N., Director of the State Railroad.—A plan for utilizing the heat wasted by kitchen stoves, and a heating and ventilating system for passenger railroad cars. 222
- 71 L'Eclair Joint Stock Co., Kessel-Loo, near Louvain (Brabant).—Match tapers. 223
- 72 Moll, Theophile, Gosselies (Hainaut).—Enameled and plated household wrought iron utensils. 224
- 73 Pas, Gerard, Brussels.—Silver, copper, and bronze household utensils. 224
- 74 Tremouroux, N. & J., Bros., Saint Gilles, near Brussels.—Polished, varnished, bronzed, enameled, plated, and wrought-iron household utensils. 224
- 75 Valania, Jean, Ixelles, near Brussels.—Machines for confectioners. 224
- 76 Vanderrest, Guillaume, Brussels.—Machine for the manufacture of sweet-meats. 224

Furniture, etc.

- 51 Demeuter, Leopold, Son, Brussels.—Furniture and hangings. 217
- 52 Dogny, Jean Baptiste, Brussels.—Balusters, ornaments for door panels. 217
- 53 Goyers, J. A. & H., Bros., Louvain.—Pulpit in the ogive style. 217
- 54 Snyers, Rang, & Co., Brussels.—Carved walnut furniture, renaissance style, ebony inlaid with ivory. 217
- 55 Teugels, Emile, Malines, Province of Anvers.—Carved furniture, a chair of the XVI century, a Flemish chair of the XVI century. 217

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 77 Baertsoen, A., & Buysse, A., Ghent.—Cotton textile fabrics. 230
- 78 Smet, E. de, & Co., Ghent.—Thread in packages; warped, unbleached and dyed skeins. 230
- 79 Desmet Bros., Ghent.—Dyed, bleached and unbleached textile fabrics. 230
- 80 Parmentier, Van Hoegarden, & Co., Ghent.—Spun cotton, bleached and unbleached printed cotton textile fabrics. 230

Woven Goods, Silks, Clothing.

- 81 Devos, Camille, & Brother, Courtrai.—Stuff for trousers. 231
- 82 Idiers, Emile, Auderghem, near Brussels.—Spun cotton, dyed Andrianople red, etc. 231
- 83 Remy-Thirion, Louvain (Brabant).—Dyed cotton textile fabrics. 231
- 84 Baertsoen, A., & Buysse, A., Ghent.—Linen textile fabrics. 233
- 85 Brandt, Jacques de, Alost.—Diapered and damasked table linen. 233
- 86 Declercq, Clement, Iseghem, East Flanders.—Twisted linen thread for machine and hand-sewing. 233
- 87 Govaert Bros., Alost, East Flanders.—Canvas, sack-cloth and bags for grain, guano, salt, etc. 233
- 88 Leirens-Eliaert of Eliaert-Cools, Alost, East Flanders.—Thread and tow for weaving, sewing thread. 233
- 89 Remy-Thirion, Louvain (Brabant).—Indigo-blue and black dyed cloth. 233
- 90 Rey, senior, Brussels.—Linen fabrics. 233
- 91 Sak, Volders, Joseph, Turnhout, Province of Antwerp.—Tickings for beds and awnings. 233
- 92 La Lys Co., Ghent.—Jute and linen thread. 233
- 93 Van Damme Bros., Roulers, East Flanders.—Cloth. 233
- 94 Van de Wynckele Bros. & Alsberge, Ghent.—Tow and linen thread bleached, at every stage. 233
- 95 Wilford, William, Tamise, East Flanders.—Imperial extra flax, merchant and navy canvas; combed flax and thread for its manufacture. 233
- 111 Herve, Fanchamps, Verviers.—Cloth and woolen stuff. 235
- 112 Lecloux, G. J., Dison.—Cloth and woolen stuff. 235
- 113 Lejeune-Vincent, H. J., Dison.—Cloth and woolen stuff. 235
- 114 Olivier, J. J., & Son, Verviers.—Cloth and woolen stuff. 235
- 115 Peltzer & Son, Verviers.—Cloth and woolen stuff. 235
- 116 Simonis, Iwan, Verviers.—Cloth and woolen stuff. 235
- 117 Taste, J., Verviers.—Cloth and woolen stuff. 235
- 118 Wihl, M., & Co., Verviers.—Cloth and woolen stuff. 235
- 119 Jamme, Armand, Saint Hadelin, (Nessonvaux,) near Verviers.—Carded woolen thread. 235
- 120 Begasse, Charles, Liège.—Felt for paper manufacture, sag-end fabrics, and woolen bed blankets. 237
- 121 Jacobs, Poelaert, & Co., Brussels.—Woolen bed blankets. 237
- 122 Rolin, H., Son, & Co., Saint Nicholas, East Flanders.—Tartan shawls, thin, light cloth, tweeds, waterproofs, lady cloth, fancy cloths, etc. 237
- 123 Braquenie Bros., Malines.—Malines tapestry. 239
- a* Portrait of Rubens, panel from Gallait.
- b* Portrait of Cousin, in Arabian costume, panel from Gallait.
- c* Eight panels together, representing eight gods, from Olympus, with all their attributes, from Audran.
- d* Full length painting—style Louis XVI.
- Silk and Silk Fabrics.**
- 124 Fonteyn Bros., Lede, East Flanders.—Black silk goods. 245
- 125 Van Bellinghen, Jos., Son, Antwerp.—Black silk cassimere, Antwerp silk and trimmings. 245
- 126 Van Bellingen, J. H., & Suremont, Max, Antwerp.—Antwerp black silk tissues. 245
- Clothing, Jewelry, etc.**
- 127 Dujardin Bros., Leuze (Hainaut).—Cotton and woolen hosiery. 250
- 128 Leyneu-Hougaerts, J. A. H., Peer, Province of Limbourg.—Church vestments, chasuble, and various embroideries. 250
- 129 Bouhon, Francois, Verviers.—Wooden and other shoes. 251
- 130 Bruycker, Theoph. de, & Co., Poincon, Brussels.—Neck handkerchiefs, false collars, shirt-bosoms, drawers and flannel vests, wrappers, handkerchiefs, chemisettes, scarfs, ladies' collars, buttons, etc. 251
- 131 Frenay Bros., Roclenge-sur-Geer (Limbourg).—Braids and straw hats. 251
- 132 Level, Leon, Brussels.—Kid gloves. 251
- 133 Vandenbos-Poelman, G., Ghent.—Shoes. 251
- 134 Watrigant, Alphonse, Brussels.—Gentlemen's, ladies', and children's shoes. 251
- 135 Begerem, René, Ypres.—Valenciennes lace. 252
- Woven and Felted Goods of Wool, etc.**
- 96 Hauzeur, Gerard, Son, Verviers.—Carded woolen thread. 235
- 97 Peltzer & Son, Verviers.—Carded woolen thread. 235
- 98 Taste, Jean, Verviers.—Carded woolen thread. 235
- 99 Baras, Navaux, Verviers.—Cloth and woolen stuff. 235
- 100 Bettonville, Clement, Hodimont, near Verviers.—Cloth and woolen stuff. 235
- 101 Biolley, Francois, & Son, Verviers.—Cloth and woolen stuff. 235
- 102 Biolley Bros. & Co., Jusleville, near Verviers.—Cloth and woolen stuff. 235
- 103 Chatten, M., & Co., Dison, near Verviers.—Cloth and woolen stuff. 235
- 104 Delhez Bros., Dison.—Cloth and woolen stuff. 235
- 105 Devosse, Blaise, Dison.—Cloth and woolen stuff. 235
- 106 Dolne, Lekeux, & Co., Dison.—Cloth and woolen stuff. 235
- 107 Domken Bros., Verviers.—Cloth and woolen stuff. 235
- 108 Dreze, H. & J., Dison.—Cloth and woolen stuff. 235
- 109 Franck Bros., Dison.—Cloth and woolen stuff. 235
- 110 Henrion, J. J., Dison.—Cloth and woolen stuff. 235

Clothing, Stationery, Weapons, Medical Appliances, Vehicles.

- 136 Crommelinck, Courtrai.—Lace. 252
 137 Dassonville, Courtrai.—Lace. 252
 138 Declercq, Clement, Iseghem, East Flanders.—Common lace of twisted thread. 252
 139 Des Mares, P. T., Laeken, near Brussels.—Lace. 252
 140 Vergnies, O., De & Sisters, Brussels.—Lace. 252
 141 Duden Bros., Brussels.—Lace. 252
 142 Everaert, Julie, & Sisters, Brussels.—White and black lace. 252
 143 Bruyneel, senior, Grammont.—Black lace. 252
 144 Groote, Vierendeel de, Grammont.—Black lace. 252
 145 Everaert, Leclercq, Jules, Grammont.—Black lace. 252
 146 Everaert Sisters, Grammont.—Black lace. 252
 147 Ghys, Bruneel, Grammont.—Black lace. 252
 148 Leclercq (widow), Grammont.—Black lace. 252
 149 Saligo, Vandenberghe, Grammont.—Black lace. 252
 150 Gillon, Steyaert, Courtrai.—Valenciennes lace. 252
 151 Rectem, Jean, Brussels.—Gold embroidered picture. 252
 152 Sacre, L., Brussels.—Lace. 252
 153 Vandezande, Goemaere, Courtrai.—Valenciennes lace. 252
 154 Verdé, Delisle Bros., & Co. (India Co.), Brussels.—Lace. 252
 155 Stoefs, George Gustave, Brussels.—Works of art in jet, black, and imitation gold jewelry, fancy goods. 253
 156 Coryn, Jules, Ghent, East Flanders.—Chignons and wigs. 254
 157 Gossieaux, Félicien, Wavre (Brabant).—Hair picture. 254

Paper, Blank Books, Stationery.

- 158 Vandamme, Pierre Jean, Brussels.—Proofs of steel engraving for stamping with colors, illuminated with gold and silver, chronograms, and coats of arms. 258
 159 Vraff, Pfeffer, & Co., Ghent.—Raw material for the manufacture of paper, worked and cleaned rags, and old paper. 259
 160 De Ploeg, Adolphe, Brussels.—Safety envelopes. 259
 161 De Tournay, Catala, Brussels.—Printing, writing, and wrapping paper, and pasteboard. 259
 162 Poissonniez, Jean Baptiste, Brussels.—Cases for jewelers, confectioners, druggists, etc., card of samples. 262
 163 Daye, F., & Co., Scharbeek, near Brussels.—Pressed leather, pasteboard made from Cordoue and Malines old hides. 264

Weapons, etc.

- 164 Fusnot, Charles, & Co., Cureghem, near Brussels.—Cartridges for weapons of every description. 265
 165 Heuse, Ernest, Nessonvaux, near Liège.—Gun-barrels. 265

- 166 Mairlot & Heuse, Fraipont (Liège).—Gun-barrels for warfare and export. 265
 167 Bayet Bros., Liège.—Fine weapons. 269
 168 Neumann Bros., Liège.—Double-barreled hunting guns. 269
 169 Tambour, Michel, Liège.—Hunting weapons. 269

Medicine, Surgery, Prothesis.

- 170 Depuy, Barthélémy, Brussels.—Pharmaceutical preparations, pamphlets on toxicology, pharmacy, and hygiene. 272
 171 Jean, Emile de, Brussels.—Collection of iron and tools for horse-shoeing. 276
 172 Denis, Brussels.—Contrivance for dressing wounds in the limbs. 276
 173 Guillery, Hippolyte, Brussels.—Sanitary report of the battle-field at Sedan in 1870; apparatus for the rapid dressing of wounds on the battle-field, etc., and for the treatment of limb fractures. 276
 174 Hermant, Emile, Bruges.—Treatise on flying ambulances, model of ambulance bags adopted by the Belgian government, memoir of the military physician. 276

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 175 Lambert, A. de, Liège.—Files for watchmakers and jewelers. 280
 176 Constant, Emile, Monceau-sur-Sambre, near Charleroi.—Cheese-vat bolts, clamps for rails, rivets, tinkers' ware. 284
 177 Demanet, Albert, Gosselies (Hainaut).—Forged nails. 284
 178 Fondu, Jean Baptiste, Brussels.—Locksmiths' work, locks for vehicles, carriages, and railway cars; nickel ware used in construction. 284
 179 Hoorickx, Guillaume, Brussels.—Two large chests—one representing an old-fashioned Flemish trunk, the other the present style. 284
 180 Nicaise, Charles, Louvière (Hainaut).—Locomotive and other bolts, screws for locomotives, screw nuts, rivets, clamps for rails, etc. 284
 181 Nicaise, Pierre & Nicolas, Marcienne, near Charleroi.—Bolts, screw-nuts and rivets, spokes, and round-nose chisels, carriage tenders, clamps, etc. 284
 182 Vehlins & Co., Chatelet, near Charleroi (Hainaut).—Iron wire, tacks, nails. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 183 Ryckere, Edouard de, senior, Iseghem, East Flanders.—Brushes and pencils. 286

Carriages, Vehicles, and Accessories.

- 184 Ruytter, Charles de, Ghent.—Carriages. 292
 185 Van Aken, Louis, Anvers.—Carriages. 292

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Chemical Manufactures.

- 1 Matthes, W. E., Amsterdam.—Sulphate of ammonia. 200
- 2 Gorter, D. & S., Sneek.—Soap. 201
- 3 Willems, P. J., Schiedam.—Oils. 201
- 4 Sauders & Co., Leiden.—Soaps. 201
- 5 Henny, C. O., Deventer.—Glue. 202
- 6 Van Colker, P. W., Utrecht.—Glue. 202
- 7 Vernay & Van Heusde, Tiel.—Dyes, turpentine, inks, wax, colors, salves. 202
- 8 Grootes, M., Westzaan.—Blueing. 202
- 9 Claasen, P. C., jr., Amsterdam.—Paints. 202
- 10 Mills, M. A.—Inks. 202
- 11 Vriesendorp, H. M., Dordrecht.—Oils and varnish. 202
- 12 Lonsbergh, V., Gravenhage.—Colors. 202
- 13 Van den Bergh, N. L. J., Arnhem.—Cologne. 203

Ceramics—Pottery, Porcelain, Glass, etc.

- 14 Van Bergen, A. H., Heiligerlee, Province Groningen.—Stone and drain tiles. 206
- 15 Van Henkelom, H. C., Utrecht.—Building stone. 206
- 16 Witteveen, G., Utrecht.—Terra cotta. 206
- 17 Koolemans—Beignen, C. G. L., Willeskop.—Architectural pottery. 206
- 18 Goedwaagen, P., Gonda.—Chemical stoneware and stoves. 207
- 19 Fontein, R., Franeker.—Roofing tiles. 208
- 20 Ravesteijn, H. F., Westraven.—Painted wall stone. 208
- 21 Bonvy, J. J. B. J., Dordrecht.—Glassware. 214

Furniture, and Objects of General use in Construction and in Dwellings.

- 22 Hooijen, L. J., Rotterdam.—Furniture and fancy articles. 217
- 23 Van Vliet, W. F., Gravenhage.—Chairs. 217
- 24 Lonman, J., Znolle.—Folding screen. 217
- 25 Van der Lugt, Gravenhage.—Furniture and fancy articles. 217

- 26 Lommen, C. H., Roermond.—Painted and cut glass. 219
- 27 Grolman, C. W., Utrecht.—Picture frames. 220
- 28 Battenberg & Co., Rotterdam.—Lamps. 223
- 29 Cool, G. Thz., Amsterdam.—Mantels. 227

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 30 Bletz & Co., Weesp.—Baskets and caps. 229
- 31 Director of Prison, Utrecht.—Mating and rugs. 229
- 32 Ter Horst, J. H., Ryssen.—Jute mating and linen. 229
- 33 Arntzenius, Jannink, & Co., Goor.—Fish nets and yarn. 230
- 34 Hilversumsche Spinning and Weaving Manufactory, Amsterdam.—Spun and woven cotton goods. 230
- 35 Planteijdt, L., Krommenie.—Thread cloth, and canvas. 230
- 36 Maas en Zonen, A. E., Scheveningen.—Fish nets. 230
- 37 Bottenheim, D. & S., Amsterdam.—Yarns. 230
- 38 Stork, C. F., Hengeloo.—Colored woven goods. 231
- 39 Swenkels, W., Helmond.—Yarns. 231
- 40 Veltman, J. A., jr., Amsterdam.—Covers and scarfs. 232
- 41 Vetman, J. A., Amsterdam.—Scarfs. 232
- 42 Elias, J., Strijp.—Table cloths, napkins, and dress goods. 233
- 43 Nieuwenhuizen & Van Stratum, Geldrop.—Towels, napkins, and table cloths. 233

Woven and Felted Goods of Wool, etc.

- 44 Telburg Woolen Manufacturing Company.—Flannels, opera cloaks, and fancy goods. 236
- 45 Zaalberg, J., Leiden.—Woolen covers. 237
- 46 De Lange, A. G., Delft.—Imitation Smyrna rugs. 239
- 47 Garjeame, A. G., Delft.—Imitation Smyrna carpets. 239
- 48 Royal Carpet Manufactory, Deventer.—Deventer hangings. 239

Woven Goods, Clothing, Stationery, Medical Appliances, Tools.

- 49 Prins, M., Deventer.—Artificial wool and cowhair carpets. 239
- 50 Van Leer, B., Amersfoort.—Hangings. 239
- 51 Veelo, P. J., Gravenhage.—Sofa cloths. 241

Silk and Silk Fabrics.

- 52 Travaglini, P. J. & W. J. P., Haarlem.—Silks. 244

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 53 Vigelius, H., Rotterdam.—Leather and leather gloves. 251
- 54 Wienbelt, W., Deventer.—Boots. 251
- 55 Costermens, C., jr., Gravenhage.—Trunks, satchels, and bags. 255

Paper, Blank Books, and Stationery.

- 56 Loeber, G., Amsterdam.—Stationery. 258
- 57 Abrahams Brothers, Middleburg.—Blank books. 261
- 58 Simons, Ph., Gravenhage.—Bindings for maps, etc. 261
- 59 Cramer, H. G. D., Ootmarsum.—Pasteboard. 262
- 60 Van der Burgh, M., Schiedam.—Imitations of marble and wood. 264
- 61 Van der Burgh, A. R. & P., Rotterdam.—Imitations of marble and wood. 264
- 62 Rijperman, C. J. F., Velzen.—Wood painting. 264
- 63 Dobbe, J. P., Gravenhage.—Wood and marble painting. 264
- 64 Kerkhoven, R., Utrecht.—Wood and marble painting. 264

Weapons, etc.

- 65 Government Arm Manufactory, Delft.—Army rifle. 265
- 66 Betou, J. P., Delft.—Breechloading rifle. 265

Medicine, Surgery, Prothesis.

- 67 Van de Loo, J. P. H., Venloo.—Plaster and bandages. 276
- 68 Schokking, J. A. J., Amsterdam.—Conical tube for injections. 276
- 69 Timon, A., Gravenhage.—Trusses. 276
- 70 Krol, W., Kampen.—Plasters and bandages. 276
- 71 Mathijssen, A., Budel.—Plaster and bandages. 276
- 72 Schoevers, A. T. C., Gravenhage.—Trusses. 276
- 73 Gori, M. W. C., Amsterdam.—Water and land conveyances for sick and wounded. 278
- 74 Committee on Sick and Wounded Soldiers.—Work of the "Red Cross." 278

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 75 Erdman-Schmidt, J. D., Helmond.—Cast engraving plates. 280
- 76 Pool, G. J. & Kamstra, P. A., Wanga.—Skates. 281
- 77 Enthoven, H. S., Zalt-Bommel.—Tinned iron kitchen utensils. 284
- 78 Van Heukelom, H. C., Utrecht.—Machine screws. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 79 Reus, H., Dordrecht.—House and ship brushes. 286

DENMARK.—STATISTICAL PREFACE.

DENMARK is situated between $53^{\circ} 23'$ and $57^{\circ} 44' 50''$ north latitude, and $8^{\circ} 5'$ and $12^{\circ} 45'$ east longitude, excepting the small island of Bornholm in the Baltic, about ninety miles east of Sceland, which lies in 15° east longitude. Denmark is bounded on the north by the Skager Rack, a gulf of the North Sea; on the east by the Cattegat, the Sound, the Baltic, and Mecklenburg-Schwerin; on the south by the Elbe; and on the west by the North Sea, which the Danes call the "Western Ocean."

The kingdom of Denmark has an area of 14,553 English square miles,	
and a population (in 1874) of about	1,860,000
Faroe Islands,	} 128,000
Iceland,	
Greenland,	
Danish possessions in the West Indies,	
Total,	1,988,000

The chief pursuits are agriculture, cattle-breeding, navigation, and fishing, about one-half of the population being engaged in these industries.

The annual yield of grain may be calculated at about 100,000,000 bushels, beside 200,000,000 barrels of potatoes, beans, etc. About three-fourths of the whole country is under cultivation. The raising of horses and cattle is quite an important interest; the statistics of live stock are, approximately, as follows: horses, 350,000; cattle, 1,250,000; sheep, 1,900,000; hogs, 450,000.

The exports consist mainly of grain, flour, horses, cattle, hogs, meat, pork, butter, wool, hides and skins, beer, brandy, train oil, etc. The principal imports are iron, coal, salt, sugar, coffee, tea, wood, cotton cloth, tobacco, rice, etc.

Of manufactures, the most important are china ware, terra cotta, tiles, crockery, glass, tobacco, lincn, cloth, paper, and soap. There are large woolen mills, sugar refineries, iron foundries, machine shops, dockyards, distilleries, tanneries, etc.; flour mills can be found in all sections of the country. The commerce is not inconsiderable, and Danish joiners' work, gold and silver ware, watches, gloves, terra cotta, etc., find ready sale abroad.

The merchant navy consisted, in 1875, of 2766 sailing vessels of 183,740 registered tons; 114 steamships of 24,323 registered tons, making a total of 2880 vessels of 208,063 registered tons.

The national wealth of Denmark is estimated at 4500 millions of crowns,* of which 3400 millions is real estate and 1100 millions capital, or about 2200 crowns to each individual.

In the 350 savings banks of the country, there were deposited, at the end of 1874, 194,308,902 crowns.

The army numbers, in all, 52,000 men. The navy consists of three iron-clad frigates and eight iron-clad corvettes, carrying 79 guns; three frigates, three corvettes, and five schooners, carrying 136 guns; twelve iron gunboats, carrying 17 guns. Also, transports, etc.

The budget for 1876-77 estimated the revenue at 50,008,843 crowns against an expenditure of 46,885,045 crowns. The public debt, April 1st, 1876, was 181,117,700 crowns against 262,034,296 crowns in 1869. The debt has, in five years, been reduced by more than 80,000,000 crowns.

(The foregoing statistics are furnished by the Danish Commission.)

* The Danish crown = 26 4-5 cents, gold.

The length of railways in the kingdom, at the end of 1874, was 1024.5 kilometres, of which 665 belonged to the State and 359.5 to companies.

The work of the post office for the year 1873-74 was 16,487,777 letters, and 15,134,812 newspapers.

The length of telegraph lines, 2545 kilometres; length of wires, 7049 kilometres; number of offices, 174; messages in 1874, 762,609.

Elementary education is widely diffused in Denmark, attendance at schools being obligatory from the age of seven to fourteen. Instruction is furnished gratuitously in the public schools to children whose parents cannot afford to pay for their teaching. Besides the university of Copenhagen, there are thirteen public gymnasia in the principal towns of the kingdom, which afford a classical education, and under them are a large number of middle schools, for the children of the trading and higher working classes. Instruction at the public expense is given in the parochial schools, of which there were, in August, 1869, 28 in Copenhagen, 132 in the towns, and 2780 in the rural districts.

Denmark is a constitutional monarchy. The people are efficiently represented, and have a voice in all public matters. The press is virtually free, and only answerable to law. The national assembly consists of the Folksting and Landsting, and is invested with very extensive powers; it meets annually for two months, but the deputies are elected triennially, and receive a fixed allowance during their sittings. The several colonies are governed by governors or high bailiffs, nominated by and alone responsible to the crown. The king has a privy council, in which there are associated with him the heir-apparent and eight members.

Commission from DENMARK to the International Exhibition :

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DENMARK.

(South of Nave, Columns 11 to 13.)

COLLECTIVE EXHIBIT.

Manufactures, Education, and Science.

Chemical Manufactures.

- 1 Aalborg Chemical Works, Aalborg.—Bicarbonate and carbonate of soda. 200
- 2 Holmblad, L. P., Copenhagen.—Stearine candles. 201
- 3 Guldberg, C. Hoegh, Copenhagen.—Varnish, and wood polished with it. 202
- 4 Hansen, C., Copenhagen.—Cheese rennet extract and coloring fluid; butter coloring. 202
- 5 Meyer & Henckel, Copenhagen.—Butter and cheese coloring, cheese rennet extract, varnishes. 202
- 6 Riise, A. H., St. Thomas, West Indies.—Double-distilled bay spirit and oil of bay leaves. 203
- 7 Odense Match Factory, Odense.—Matches. 204

Ceramics—Pottery, Porcelain, Glass, etc.

- 8 Hesse, Georg, W., Copenhagen.—Terra cotta vases, jugs, etc. 206
- 9 Ipsen's, P., widow, Copenhagen.—Terra cotta vases, tazzas, figures, etc. 206
- 10 Wendrich & Son, Copenhagen.—Terra cotta bas-reliefs, bowls, vases, etc. 206
- 11 Royal Porcelain Manufactory, Copenhagen.—Biscuit bas-reliefs after Thorwaldsen, exhibited by the Commissioner. 212
- 12 Argentine Manufactory, Copenhagen.—Porcelain covered with copper, silver, and gold. 213

Furniture and Objects of General Use in Construction and in Dwellings.

- 13 Hansen, C. B., Copenhagen.—Furniture. 217
- 14 Meidel, F., Copenhagen.—Fire-proof safes. 217
- 15 Christesen, V., Copenhagen.—Silverware, tea and coffee sets, etc. 218
- 16 Stenstrup, Copenhagen.—Sign painting. 227

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 17 Ramsing, Th., Aarhus.—Dyed linen fabrics. 233

Woven and Felted Goods of Wool and Mixtures of Wool.

- 18 Müller, H., Faroe Islands.—Woolen goods. 235

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 19 Möller, C., Copenhagen.—Water-proof oil clothing. 250
- 20 Larsen, N. F., Copenhagen.—Gloves. 251
- 21 Christesen, V., Copenhagen.—Jewelry and ornaments. 253
- 22 Assam, H. M., Odense.—Tobacco pipes, etc. 254
- 23 Ovre, Mrs., Copenhagen.—Artificial flowers. 254

Paper, Blank Books, Stationery.

- 24 Holmblad, L. P., Copenhagen.—Playing cards. 262
- 25 Hansen, Carl, & Co., Ebeltoft.—Impregnated pasteboard. 262

Educational Systems, Methods, and Libraries.

- 1 Hveisel, G., Randers.—School maps. 300
- 2 Simonsen, C., Copenhagen.—"Punch," an illustrated paper. 306
- 3 Steenberg, A., Copenhagen.—"Industridenden," an industrial paper. 306

Institutions and Organizations.

- 4 Browning, Georg, Copenhagen.—Ethnographical collection, products, minerals, etc., from Iceland and Faroe Islands. 312
- 5 Müller, H., Faroe Islands.—Collection of birds, feathers, eggs, etc. 312
- 6 Harboe, C., Copenhagen.—Ethnographical collection; products, minerals, etc., from Greenland. 312

Scientific and Philosophical Instruments and Methods.

- 7 Bie, C., Aalborg.—Arithmometer. 321
- 8 Ferslew, C., & Co., Copenhagen.—Register for cars, etc. 323

Engineering, Machines, Agriculture.

Engineering, Architecture, Maps, etc.

- 9 The Royal Staff, Copenhagen.—Topographical maps. 335
- 10 Steen, C., & Son, Copenhagen.—Geographical, historical, meteorological, and other maps. 335

Machines, Tools, and Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 1 Ambrosiussen, O. P., Copenhagen.—Model of a scaffold. 503

Machines and Implements of Spinning, Weaving, Felting, and Paper-making.

- 2 Tullesen, P., Lyngby.—Hair-braiding machine. 524

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 3 Henriksen, H., Copenhagen.—Sewing machine. 530

Machines for Printing, Making Books, Paper-working, etc.

- 4 Hansen, R. Malling, Copenhagen.—The tachygraph, operated by electricity, and the type-writing ball, operated by hand. 542

Motors, Power Generators, etc.

- 5 Godfredsen, R., Copenhagen.—Belt-ing, etc., for transmission of power. 553

Arboriculture and Forest Products.

- 1 Halkier, P. A., Copenhagen.—Timber, planks, boards, rough and finished, for buildings, etc. 600

Agricultural Products.

- 2 Wendt, Frantz, Roeskilde.—Rye, winter and spring wheat, barley, and oats. 620

Animal and Vegetable Products.

- 3 Danish Preserved Butter Co., Aarhus.—Canned butter for export. 651
- 4 Heymann, P. W., Copenhagen.—Preserved butter for export, also butter which was at the Vienna Exposition in 1873. 651

- 5 Copenhagen Leather Manufactory, Copenhagen.—Consolidated leather soles, heels, sheets, etc. 652

- 6 Pork Packing Co., Copenhagen.—Lard packed in bladder. 652

- 7 Eriksen, C., Lyngby.—Honey and wax. 654

- 8 Müller, P. A. E., Copenhagen.—Honey and wax. 654

- 9 Herreborg, Otto, Copenhagen.—Preserved fruit, vegetables, jellies, etc. 656

- 10 Brøndum, A., Copenhagen.—Corn brandy and table liquor. 660

- 11 Aalborg Syrup and Spirit Factory, Aalborg.—Table liquor and spirit. 660

- 12 Anthony, F., Copenhagen.—Brandy and liquors. 660

- 13 Been, C. A., Copenhagen.—Liquors, etc. 660

- 14 Gottschalk, I. C., Holbek.—Essences. 660

- 15 Eriksen, C., Lyngby.—Mead. 660

- 16 Heering, Peter F., Copenhagen.—Cherry cordial. 660

- 17 Lorenzen, L., Aarhus.—Bitter cordial. 660

- 18 Odin Distillery, Randers.—Corn brandy flavored with caraway seeds, table liquor, and rectified spirit. 660

- 19 Sabro, I. C., Randers.—Bitters, etc. 660

- 20 Schucani & Wegmann, Copenhagen.—Liquors, bitters, etc. 660

- 21 Svanholm Brewery, Copenhagen.—Beer for export. 660

- 22 Ramsing, T., Aarhus.—Chocolate. 661

Textile Substances of Vegetable or Animal Origin.

- 23 Müller, H., Farøe Islands.—Wool. 667

Machines, Implements, and Processes of Manufacture.

- 24 Schültz, Thurebyholm.—Model of milk cooler. 675

Agricultural Engineering and Administration.

- 25 Aalborg Chemical Works, Aalborg.—Artificial bone manure. 681

SWEDEN.

(North of Nave, Columns 6 to 11.)

Chemical Manufactures, Ceramics, Glass.

Chemical Manufactures.

- 1 Aseptin Amykos Stock Co.—Upsala Aseptin, for preservation of provisions and animal materials. 200
- 2 Bengtson, B., Astra Torp, Trelleborg.—Chemicals. 200
- 3 Eurenus & Svalander, Stockholm.—Chemicals. 200
- 4 Friestedt, A. W., Stockholm.—Chemicals. 200
- 5 Gullbergs, Theod., Stock Co., Göteborg.—Sulphuric acid. 200
- 6 Liljeholmens Stearine Manufactur-Stock Co., Stockholm.—Stearine candles, oleine, glycerine, and stearine. 201
- 7 Malmö Soap Factory, Malmö.—Soaps. 201
- 8 Werner, C. O., Stockholm.—Bone oil. 201
- 9 Ekman, C. L., Stockholm.—Liquid indian ink, indelible writing ink. 202
- 10 Gullbergs, Theod., Stock Co., Göteborg.—Ink. 202
- 11 Klint, Bernhardt & Co., Stockholm.—Varnishes. 202
- 12 Levantens Dye Works, Göteborg.—Specimens of dyeing. 202
- 13 Lundgren, P. W., Stockholm.—Copying ink. 202
- 14 Strandberg, Fr. Aug., Jönköping.—Varnishes, ink. 202
- 15 Wahlgren, J. E., Göteborg.—Specimens of dyeing. 202
- 16 Aseptin Amykos Stock Co.—Upsala Amykos, used as cosmetics. 203
- 17 Granholm, J. P., Stockholm.—Rectified Amykos. 203
- 18 Pauli F., Stockholm.—Essences, perfumery, cosmetics. 203
- 19 Strandberg, Fr. Aug., Jönköping.—Perfumery. 203
- 20 Zadig, N., Malmö.—Perfumery. 203
- 21 Match Manufacturing Co., Stockholm.—Safety matches. 204
- 22 Berg, Gottfried Warby, Stockholm.—Gunpowder. 204
- 23 Blombacka Stock Co., Molkom.—Safety matches and their raw materials. 204
- 24 Bodé, Patrick, Stockholm, for the Guesta Match Manufactory.—Paraffined safety matches. 204
- 25 Holmberg, Eric, Södertelje.—Safety matches. 204

- 26 Jönköpings Match Manufacturing Co., Jönköping.—Safety matches. 204
- 27 Kreuger, P. E., & Jennings, Kalmar.—Safety matches. 204
- 28 Körner, Ferd., & Co., for the Ellbo works, Göteborg.—Matches. 204
- 29 Lindahl, J. F., Kalmar.—Safety matches. 204
- 30 Lovers Manufacturing Co., Kalmar.—Matches. 204
- 31 Norrköpings Match Manufacturing Co., Norrköping.—Safety matches and appurtenances. 204
- 32 Stregnas Match Manufacturing Co., Stregnäs.—Safety matches. 204
- 33 Phoenix Match Manufacturing Co., Malmö.—Matches. 204
- 34 Vulcan Match Manufacturing Co., Göteborg.—Matches. 204
- 35 Westerviks Match Factory, Westervik.—Matches. 204
- 36 Visby Match Factory, Visby.—Matches. 204
- 37 Ystads Match Manufacturing Co., Ystad.—Safety matches. 204

Ceramics—Pottery, Porcelain, Glass, etc.

- 38 Gustafsbergs Manufacturing Co., Stockholm.—Architectural pottery. 206
- 39 Helsingborgs Pottery Manufacturing Co., Helsingborg.—Salt glazed clay goods. 207
- 40 Höganäs Coal Mining Co., Höganäs.—Fire clay goods. 207
- 41 Höganäs Stenkolsverks Bolag, Höganäs.—Tiles for pavements. 208
- 42 Gustafsbergs Fabriks Intressenter, Stockholm.—Faience. 210
- 43 Rörstrands Stock Co., Stockholm.
 - a Faience. 210
 - b Majolica and palissy ware. 211
 - c Biscuit ware and parian. 213
 - d Porcelain. 213
- 44 Gustafsberg Fabriks Intressenter, Stockholm.—Biscuit ware and parian. 212
- 45 Gustafsbergs Fabriks Intressenter, Stockholm.—Porcelain and Argentine. 213
- 46 Malmö Porcelain Manufacturing Co., Malmö.—Porcelain for table use. 213
- 47 Brusewitz, Fr., Limmared.—Glassware. 215
- 48 Reymyre Glass Factory, Simonstorp.—Glassware. 215

Furniture, Woven Goods, Silks, Clothing.

Furniture and Objects of General Use
in Construction and in Dwellings.

- 49 Backman, J. F., Stockholm.—
Safe. 217
- 50 Glömsta Factory, Huddinge.—Cot-
tage furniture. 217
- 51 Lastbom, Iven, Stockholm.—Cup-
board of birchwood. 117
- 52 Petterson, C. E., Stockholm.—Ta-
ble. 217
- 53 Rambach, C., Stockholm.—Chair. 217
- 54 Rusch, P. C., Göteborg.—Japanned
furniture. 217
- 55 Sandberg, A. Cook, Stockholm.—
Writing chair. 217
- 56 Wahlström, S. Fr., Stockholm.—
Willow furniture. 217
- 57 Osterberg, C. G., Jäder Eskilstuna.—
School furniture. 217
- 58 Bruzewitz, Fr., Limmared.—Table
glass. 218
- 59 Goldsmiths' Stock Co., Stockholm.
—Silver tankard. 218
- 60 Gustafsbergs Manufacturing Co.,
Stockholm.—Table china. 218
- 61 Reymyre Glass Factory, Simon-
storp.—Table glass. 218
- 62 Rörstrands Stock Co., Stockholm.
a Table china. 218
b Stoves. 222
- 63 Petterson, C. E., Stockholm.—
Frame. 220
- 64 Bolinders, J. & C. G., Machine Co.,
Stockholm.—Stoves and ranges. 222
- 65 Hedengren & Son.—Stove Sets. 222
- 66 Eriksson, G.—Brass doors for
stoves. 222
- 67 Kockum, F. H., Malmö.—Kitchen
utensils of iron and steel sheets. 222
- 68 Mobergs Machine Co., Stockholm.—
Range. 222
- 69 Odhner & Co., Stockholm.—Gas
ranges. 222
- 70 Wiberg, Martin, Stockholm.—Kit-
chen range. 222
- 71 Wiman & Co., Stockholm.—
Stove. 222
- 72 Akerlinds Stock Co., Stockholm.—
Stoves. 222
- 73 Elfving C. E., Stockholm.—Appa-
ratus for cutting lamp wicks. 223
- 74 Kuntze & Co., Stockholm.—Water
filters, refrigerators. 224
- 75 Lafquist, J. A., Eskilstuna.—
Smoothing irons. 225
- 76 Björk, J. O., Eskilstuna.—Hardware
of mollified iron. 227
- 77 Dickson, James, & Co., Sandarne,
Stockholm.—Woodwork for buildings. 227
- 78 Von Essen, H. H., Baron, Tidaholm.
—Woodwork for buildings. 227
- 79 Hedlund, Joh.—Metal work for
buildings. 227
- 80 Naesman, A. E.—Metal work for
buildings. 227
- 81 Tunell, E. A.—Iron work for build-
ings. 227

- 82 Wengström, J. O., Stockholm.—
Manufactured parts of buildings. 227

Yarns and Woven Goods of Vegetable
or Mineral Materials.

- 83 Anderson, J., Kjärdingagärde,
Gnosjö.—Wire and sieve cloth. 228
- 84 Berg, J. Th., Nääs, Floda.
a Cotton yarns. 230
b Dyed cotton yarn. 231
- 85 Hargs Manufacturing Co., Nykö-
ping.—Cotton yarns and fabrics. 230
- 86 Malmö Manufacturing Co., Malmö.
a Cotton yarns. 230
b Dyed cotton fabrics. 231
- 87 Rosenlunds Spinning Co., Göteborg.
—Cotton yarns and fabrics. 230
- 88 Aby Stock Co., Stockholm.—Cot-
ton yarn. 230
- 89 Johansson & Carlander, Göteborg.—
Cotton goods. 232
- 90 Stenburgs, G., Widow, Jönköping.—
Linen fabrics. 233

Woven and Felted Goods of Wool, etc.

- 91 Bergsbro Stock Co., Norrköping.—
Card-wool fabrics. 235
- 92 Drags Stock Co., Norrköping.—
Card-wool fabrics. 235
- 93 Landskrona Manufacturing Co.,
Landskrona.—Card-wool fabrics. 235
- 94 Malmö Woolen Manufacturing Co.,
Malmö.—Card-wool fabrics. 235
- 95 Stockholms Woolen Manufac-
turing Co., Stockholm.—Woven and felted
goods of wool. 235

Silk and Silk Fabrics.

- 96 Almgren, K. A., Stockholm.—Plain
woven silks. 245
- 97 Fyrwald, C. J. M., Stockholm.—
Military trimmings. 249

Clothing, Jewelry, and Ornaments,
Traveling Equipments.

- 98 Ek, J. A., Stockholm.—Military
equipments. 250
- 99 Fernlund, E. F., Stockholm.—Mil-
itary clothing. 250
- 100 Heurlin, G. U., & Co., Stockholm.
—Military clothing. 250
- 101 War Department, Stockholm.—
Complete equipment of foot and mounted
soldiers; specimens of cloth, linen, etc. 250
- 102 Morell, S. O., & Co., Stockholm.—
Military equipment. 250
- 103 Swedmark, G., Malmö.—Leather
jackets. 250
- 104 Wallgren, A. R., Stockholm.—Mil-
itary clothing. 250
- 105 Forssell, David, & Co., Stockholm.
—Hats and caps. 251
- 106 Jacobson & Anderson, Malmö.—
Gloves. 251
- 107 Svanberg, C. E., Jönköping.—
Boots and shoes. 251
- 108 Swedmark, G., Malmö.—Gloves. 251
- 109 Tornberg, Olof, Göteborg.—Boots
and shoes. 251

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Clothing, Stationery, Weapons, Medical Appliances, Tools.

- 110 Adberg, C. R., Stockholm.—Hunting boots. 251
- 111 Pettersson, C. E., Stockholm.—Embroidered portrait of Washington. 252
- 112 Klintberg, J. W., Wisby.—Jewelry made of petrifications. 253
- 113 Anderson, J., Kjärtingagärde, Gnosjö.—Pins. 254
- 114 Berg, F. J., Göteborg.—Wigs. 254
- 115 Billström, A., Mrs., Stockholm.—Artificial flowers. 254
- 116 Bergström, P. N., Stockholm.—Furs. 256
- 117 Forssell, David, & Co., Stockholm.—Furs. 256
- 118 Royal Centennial Commission, Stockholm.—Life-size figures, dressed in national costume. 257

Paper, Blank Books, Stationery.

- 119 Berggren, A. N., Stockholm.—Penholders. 258
- 120 Brunell, J. E., Stockholm.—Penholders. 258
- 121 Klintberg, J. W., Wisby.—Letter-presses of petrifications. 258
- 122 Kullgrens, C. A., Widow, Uddevalla.—Letter-presses of polished granite. 258
- 123 Nordström, M. S., Stockholm.—Stamps for marking on linen or paper. 258
- 124 Bock, Ch. A., Klippan, Aby.—Paper. 259
- 125 Grycksbo Factory, Falun.—Filtering, writing, drawing, blank book paper, etc. 259
- 126 Lithographic Stock Co., Norrköping.—Envelopes. 259
- 127 Bock, Ch. A., Klippan, Aby.—Wood pulp and straw pulp. 260
- 128 Ekman, C. D., Bergvik.—Wood pulp chemically prepared. 260
- 129 Lewenhaupt, Sten, Count, Wermbohl, Katrineholm.—Wood pulp, chemically prepared. 260
- 130 Malmö Wood Manufacturing Co., Delaryd, Elmhult.—Wood pulp, chemically prepared. 260
- 131 Munkedals Stock Co., Uddevalla.—Wrapping paper. 260
- 132 Munksjö Paper Factory, Jönköping.—Wrapping paper. 260
- 133 Rosendahl Manufacturing Co., Göteborg.—Paper pulp of wood and straw, paper. 260
- 134 Wargöns Stock Co., Rannum.—Printing paper for newspapers. 260
- 135 Litografiska Stock Co., Norrköping.
- a Blank books, sets of account books, billheads, etc. 261
 - b Playing cards. 262
- 136 Tidström, C. W., Stockholm.—Account books, portfolios. 261
- 137 Djupafors' Manufacturing Co., Palander, Ronneby.—Pasteboard. 262
- 138 Köhler & Co., Malmö.—Playing cards. 262

- 139 Djupafors' Paper Factory Palander, Ronneby.—Pasteboard for walls, building paper, and method for using it. 263
- 140 Munksjö, Jönköping.—Building paper. 263
- 141 Edgren, Julius, Jönköping.—Wall paper. 264
- 142 Kaberg, C. A., Stockholm.—Wall paper. 264
- 143 Mineur, C. G., Stockholm.—Wall-paper, imitation of leather, and ornaments of wood pulp. 264
- 144 Munkedals Stock Co., Uddevalla.—Wall paper. 264
- 145 Rosell, P. A., & Co., Jönköping.—Wall paper. 264

Weapons, etc.

- 146 Husqvarna Arms Manufacturing Co., Jönköping.
- a Military small arms, muskets, and revolvers. 265
 - b Fire arms for sporting and hunting. 269
- 147 Royal Ordnance Department, Stockholm.
- a Military small arms from the royal factory at Carl Gustafs Stad. 265
 - b Field gun with carriage, ammunition carriage, field forge. 266
 - c Fortification ordnance with carriage and shots. 267
- 148 Motala Machine Co., Motala.—Steel guns. 266
- 149 Palmcrantz, Helge, Stockholm.—Mitrailleuse. 266
- 150 Ekman, Carl, Finspong, & De Maré, A. Ankarsrum.—Shots and shells. 267
- 151 Eskilstuna Iron Manufacturing Stock Co., Eskilstuna.—Blades of swords, sabres, foils, and hunters' hangers. 263
- 152 Morell, S. O., & Co., Stockholm.—Sword ornamented in old Norse style. 268
- 153 Norrström, Alf., Eskilstuna.—Knives and hangers. 268

Medicine, Surgery, Prothesis.

- 154 Almén, Aug., Upsala.—Medicated gelatine. 292
- 155 Lamm, Axel, M., Stockholm.—Galvano-caustical apparatus, ulterinamophor. 275
- 156 Royal War Medical Department, Stockholm.—Surgical instruments for military use. 276
- 157 Stille, Alb., Stockholm.—Surgical instruments. 276
- 158 Zander, G. M., Stockholm.—Apparatus for mechanical gymnastics. 276

Hardware, Edge Tools, Cutlery, and Metallic Products.

COLLECTIVE EXHIBIT OF MANUFACTURERS OF HARDWARE AND METALLIC PRODUCTS IN ESKILSTUNA.

- 159 Eskilstuna Iron Manufacturing Co.—Screw plates and hinges. 280
- 160 Liberg, B. & O., Rosenfors.
- a Edge tools. 280
 - b Cutlery. 281
- 161 Nya File Manufactory.—Files. 280
- 162 Oberg, C. O., & Co.—Files. 280

Hardware, Cutlery, Various Fabrics, Vehicles.

- | | |
|--|---|
| 163 Fagersta Manufacturing Co.,
Westanfors.—Saws. 280 | 183 Kockum, F. H., jr., Malmö, Ronne-
by.—Nails. 284 |
| 164 Uddeholms Stock Co., Råda.—
Hand tools. 280 | 184 Robson, Albert, Aspa, Askersund.
—Nails and spikes. 284 |
| 165 Engström, Joh.—Razors. 281 | 185 Sundström, J. O., Charlottenberg.
—Nails and spikes. 284 |
| 166 Gustafson, G.—Knives. 281 | 186 Uddeholms Stock Co., Rådt.—
Springs. 284 |
| 167 Halling, A.—Knives. 281 | 187 Wiklund, W., Stockholm.—Brass
works. 284 |
| 168 Heljestrand, Christoffer.—Razors,
knives, and corkscrews. 281 | 188 Wikström, J. A., Lulea.—Nails. 284 |
| 169 Ståhlberg, L. F., Ståhlfors—Cut-
lery. 281 | |
| 170 Svalling, E. M.—Knives. 281 | Fabrics of Vegetable, Animal, or Min-
eral Materials. |
| 171 Söderén, F. W.—Knives. 281 | 189 Tuxen, Louis von, Stockholm.—
Fabrics of patent leather. 285 |
| 172 Hedlund, Joh.—Locks. 284 | 190 Stocklassa, F., Stockholm.—
Brushes. 286 |
| 173 Jernberg, S.—Latches. 284 | 191 Landquist, S. & K., Kubikenborg,
Sundsvall.—Turned wooden vessels. 289 |
| 174 Lafqvist, J. A.—Hinges. 284 | 192 Galvanizing Stock Co., Carlskrona.
—Galvanized sheet iron. 291 |
| 175 Lagerbäck, H.—Locks. 284 | |
| 176 Lindström, J. F.—Hardware. 284 | Carriages, Vehicles, and Accessories. |
| 177 Naesman, E. A.—Locks. 284 | 193 Laval, G. de, Falun.—Veloci-
pede. 293 |
| 178 Stenman, F. A.—Locks. 284 | 194 Naesman, E. A., Eskilstuna.—Hal-
ters. 296 |
| 179 Strandberg, J.—Brass. 284 | |
| 180 Strandell, A. L.—Hardware. 284 | |
| 181 Walén, Joh.—Locks. 284 | |
| 182 Fagersta Hardware Stock Co.,
Westanfors.—Nails. 284 | |

NORWAY.

(North of Nave, Columns 4 to 7.)

Chemical Manufactures, Ceramics, Glass.

Chemical Manufactures.

- 1 Bergen Gas Works, Bergen.—Sul-
phate of ammonia, raw and refined. 200
- 2 Borthen, J., Trondhjem.—Medical
cod-liver oil. 201
- 3 Hanssen, F., Aalesund.—Pure medi-
cal cod-liver oil. 201
- 4 Hoel, P. C., Aalesund.—Pure medi-
cal cod-liver oil. 201
- 5 Jordan, C., Trondhjem.—Pure medi-
cal cod-liver oil. 201
- 6 Moller, Peter, Christiania. — Cod-
liver oil. 201
- 7 Steen, Daniel, Christiania.
a Soaps. 201
b Essences, perfumery, pomades, cosmet-
ics. 203
- 8 Holmen's, G. R., Technical Works,
Fuglesang, Christiania.—Writing ink,
aseptine, diamond oil blacking, grease
for leather. 202
- 9 Jacobsen, Jacob, Christiania.—Varn-
ishes, with specimens illustrating the
various stages of production. 202
- 10 Rode, C. N., Porsgrund.—Scandina-
vian ink, writing and copying, dark vio-
let copying ink. 202

- 11 Christiania Match Manufactory,
Christiania.—Safety and common
matches. 204
- 12 Dons, Henrik, Christiania.—Matches
from Bryn manufactory. 204
- 13 Fredrikshalds Match Manufactory,
Fredrikshald.—Matches. 204
- 14 Frolich & Son, F. H., Christiania.—
Safety percussion caps for nitro-glycerine
compounds. 204
- 15 Liadalens Company, F. H. Frolich &
Son, Christiania.—Blasting powder, gun
and rifle powder, mining cartridges, py-
rolithe (safety blasting powder). 204
- 16 H. Jolsens, Match Manufactory,
Christiania.—Matches. 204
- 17 Nitedals Match Manufactory, Chris-
tiania.—Safety and common matches. 204
(For Whale Oil, see Agricultural Catalogue,
page 49.)

Ceramics—Pottery, Porcelain, etc.

- 18 Schwarzenhorn, Fr. von, Christi-
ania.—Painted and decorated porce-
lain. 213

Glass and Glassware.

- 19 Vallo Glass Works, Vallo.—Wine
and ale bottles. 215

Furniture, Woven Goods, Clothing, Stationery, Hardware.

- 20 Berg, Harald, Christiania.—Decorative glassware. 216

Furniture and Objects of General Use in Construction and in Dwellings.

- 21 Gram, Wm., Christiania.—Antique buffet, bedstead, and cupboards. 217
- 22 Holst, Chr., Head Steward to His Majesty the King, Christiania.—Buffet chairs, antique arm chairs, peasant chair. 217
- 23 Klemetsen, Chr., Joiner, Christiania.—The fittings of the Norwegian department. 217
- 24 Moestue & Co., Thv., Christiania.—Iron safe. 217
- 25 Opsahl, P. J., Christiania.
a Iron safes. 217
b Collection of locks. 284
- 26 Vulcan Foundry and Mechanical Works, Christiania.—Iron safe, packed with an incombustible and non-conducting material. 217
- 27 Olsen, Th., Bergen.
a Filigree silver ornaments for the table. 218
b Filigree silver ornaments to be worn upon the person. 253
- 28 Drammen Foundry and Mechanical Works, Drammen.—Stoves. 222
- 29 Nord & Son, M. E., Christiania.—Refrigerator. 224
- 30 Christiania Doorhandle Works, Christiania.—Doorhandles. 227

(For stoves, see page 88.)

(For doorhandles, see page 88.)

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 31 Christiania Sail Cloth Manufactory, Christiania.
a Sail cloth. 230
b Fishing yarns and nets. 647
- 32 Nydalens Company, Christiania.
a Cotton, sail cloth, tissues, and yarns. 230
b Fishing nets, etc. 647
- 33 Jebsen & Co., P., Arne, near Bergen.—Gray, bleached, and dyed domestics, twills and shirtings, gingham. 230
- 34 Eche & Son, J. D., Bergen.—Floor oil cloths. 234

Woven and Felted Goods of Wool and Mixtures of Wool.

- 35 Jebsen & Co., P., Arne, near Bergen.—Regattas, flannels, domets, blankets, etc. 236
- 36 Pettersen, Gunerius, Christiania.—Textile domestic industry, valises. 238

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 37 Ramm & Clausen, J., Sahlhuus, near Bergen.—Hosiery. 250
- 38 Arctander, L., Christiania.—Leathern jackets. 250
- 39 Holmen, Einar, Christiania.—Ready-made linen. 250
- 40 Falkenberg, Johs., Christiania.—Ready-made linen. 250
- 41 Næss, H. S., Christiania.—Boots and shoes. 251

- 42 Nordahl, Petter N., Christiansand.—Boots. 251

- 43 Amundsen, Miss E., Tromsø.—Embroideries. 252

- 44 Gramm, Wm., Christiania.
a Collection of antique and modern silver ornaments worn upon the person. 253
b National costumes from Hardanger. 257

- 45 Lie, P. A., Christiania.—Silver filigree work in Norwegian style. 253

- 46 Tostrup, J., Christiania.—Silver work; silver filigree work in specific Norwegian style. 253

- 47 Larsen, G., Lillehammer.—Carved meerscham pipes. 254

- 48 Pettersen, Andr., Bergen.—Hair dresses. 254

- 49 Kittelsen, Jens, Christiania.—Valises. 255

- 50 Brandt, C., Bergen.—Furs, skins, etc. 256

- 51 Rustad, A. S., Drammen.—Collection of Norwegian furs. 256

- 52 Fandrem, O. C., Karasjok.—Lapp costumes. 257

Paper, Blank Books, and Stationery.

- 53 Otterelven's Paper Mills, Christiansand.—Printing paper. 260

- 54 Moestue & Co., Thv., Christiania.
a Account books. 261
b Asphalt paper for covering roofs. 263

- 55 Christophersen, Chr., Christiania.—Wood pulp for paper manufacturing. 263

- 56 Frolich & Son, F. H., Christiania.—Paper hangings and borders. 264

Military and Naval Armaments, Ordnance, Firearms, and Hunting Apparatus.

- 57 Mette, Jean, Christiania.—National daggers. 268

Medicine, Surgery, Prothesis.

- 58 Ditten, H. S., Christiania.—Aperient tonic pills, tourist pharmacies. 272

Hardware, Edge Tools, Cutlery and Metallic Products.

- 59 Michelsen, John B., Bergen.
a Cutlery. 281
b Brass goods. 283
c Carvings in wood and walrus teeth. 405

- 60 Blunck, C., Christiania.—Metal hollow ware, cast iron ware. 283

- 61 Krogstad Society, Drammen.—Nails and spikes, machine-made by hot and cold process. 284

- 62 Mustad, O., & Son, Gjøvik.—Spikes. 284

(For anchors and chains, see page 88.)

(For locks, see page 88.)

Fabrics of Vegetable, Animal, or Mineral Materials.

- 63 Jordan, W., Christiania.—Brushes. 286

- 64 Timm, Wm., Christiania.—Ropes and cordage. 287

Cordage, Basket Ware, Vehicles.

- | | |
|---|---|
| <p>65 Fredriksvorn Rope Manufacturing,
Fredriksvorn.—Cordage. 287</p> <p>66 Kuhne, W., Christiania.—Basket
ware. 289</p> <p>Carriages, Vehicles, and Accessories.</p> <p>67 Heffermehl, L., Drammen.
a Carriages (kariols). 292
b Racing sledge. 295</p> | <p>68 Sorensen & Klovstad, Christiania.
a Carriages (kariols). 292
b Racing sledge. 295</p> <p>69 Christensen, Chr., Christiania.
a Carryall. 292
b Sleigh, an antique sleigh. 295</p> <p>70 Lilloe, J., Christiania.—Harnesses
for Norwegian carriages (kariols) and
racing sledges, saddlery. 296</p> |
|---|---|

ITALY.

(North of Nave, Columns 1 to 5.)

Chemical Manufactures.

Chemical Manufactures.

- | | |
|--|---|
| <p>1 Mineralogical Society of Naples.—
Sulphurous products. 200</p> <p>2 Salinella, Baron Michele, Nicosia,
Catania.—Rock salt. 200</p> <p>3 Musumeei, Gulli Gaetano, Catania.
—Licorice. 200</p> <p>4 Giacomazzi, Favare Salvatore, Tra-
pani.—Sea salt. 200</p> <p>5 Giacomazzi, Rocco, Trapani.—
Licorice. 200</p> <p>6 Martorana, Paladino S., Trapani.—
Sea salt. 200</p> <p>7 Mazullo, Cav. Agostino, Mandanui,
Messina.—Rock salt. 200</p> <p>8 Pirrone, Antonino, of Gaetano, Mes-
sina.—Licorice. 200</p> <p>9 Labonia, B. G., Naples.—Lico-
rice. 200</p> <p>10 Romano, Gaetano, Palermo.—
Salt. 200</p> <p>11 Ferrino, Cesare, Turin.
a Nitrate. 200
b Colors in powder and paste. 202</p> <p>12 Baroncelli, Baldassarre, Cinciano,
Sienna.—Bicarbonate of potassium and
sodium. 200</p> <p>13 Borelli, Luigi, late Tommaso, Asti,
Alexandria.—Cream of tartar, acids. 200</p> <p>14 Reimandi, Guiseppe, Acqui, Alex-
andria.—Cream of tartar, tartaric
acid. 200</p> <p>15 Gentili, Grassin, late Guiseppe, Pa-
dua.—Cream of tartar. 200</p> <p>16 Sbertoli, Guiseppe, late Domenico,
Genoa.—Carbonate of lead. 200</p> <p>17 Candiani & Biffi, Milan.—Acids and
chemicals. 200</p> <p>18 Emmanuele, Francesco, Catania.—
Cream of tartar. 200</p> <p>19 Grimaldi, Giovanni, Paterno, Sicily.
—Extract of licorice. 200</p> <p>20 Pastore, Gio., late Filippo, Catania.
—Juice of licorice. 200</p> | <p>21 Grasso, Guiseppe, Catania.—Juice
of licorice. 200</p> <p>22 Catanzaro, Guiseppe, Termini, Pa-
lermo.—Licorice paste. 200</p> <p>23 Lancia di Brolo, Duke Federigo,
Palermo.—Sea salt. 200</p> <p>24 Fonzo, Domenico, Catania.—Cream
of tartar. 200</p> <p>25 Di Mauro, Francisco, Catania.—
Cream of tartar. 200</p> <p>26 Scuderi, Guiseppe, Catania.—Cream
of tartar, zamba. 200</p> <p>27 Rampazzini, Frederico, Milan.—
Sulphur and chemicals. 200</p> <p>28 Solinas, Arras Guiseppe, Sassari.—
Olive oil. 201</p> <p>29 Oneto, Agostini, & Co., Sampier-
darena, Genoa.—Soap. 201</p> <p>30 Agostini Della Seta, Count Alfredo,
Pisa.—Olive oil. 201</p> <p>31 Cenami, Count Bartolomeo, Lucca.
Olive oil. 201</p> <p>32 Mingori, Vincenzo, Lucca.—Olive
oil. 201</p> <p>33 Tellini, Vinnoco, Calci, Pisa.—Olive
oil. 201</p> <p>34 Tellini, Dario, & Co., Cascina, Pisa.
—Olive oil soap. 201</p> <p>35 Bonei, Casuccini Ottavio, Sienna.—
Olive oil. 201</p> <p>36 Contucci, Eustachio, Montepu-
leiano, Sienna.—Olive oil. 201</p> <p>37 Lanza Brothers, Turin.—Stearine,
candles, soap. 201</p> <p>38 Rinaldo, Raffaele, Salerno.—Olive
oil. 201</p> <p>39 Guglielmini, Andrea, Salerno.—
Olive oil. 201</p> <p>40 Virgili, Angelo, Vacone, Perugia
cy.—Olive oil. 201</p> <p>41 Rosselli Del Turco, Pier Francesco,
Florence.—Olive oil. 201</p> <p>42 Capponi, Conti Brothers, Florence.—
Olive oil. 201</p> |
|--|---|

Chemical Manufactures.

- 43 Alli Macarani Claudio, Florence.—
Olive oil and paste of Zanza. 201
- 44 Corsini, Prince Tommaso, Florence.—
—Olive oil. 201
- 45 Merlini, Alfonso, & Enrico Bros.,
Terriciuola, Pisa.—Olive oil. 201
- 46 Farinola, M. Paolo, Florence.—
Olive oil. 201
- 47 Albergotti, Geo., & Agostino Bros.,
Arezzo.—Olive oil. 201
- 48 Rospigliosi, Prince Clemente, Lam-
povecchio, Florence.—Olive oil. 201
- 49 Chamber of Commerce and Arts,
Sienna.—Olive oil. 201
- 50 Saracini, Alessandro, Sienna.—
Olive oil. 201
- 51 Pucci, Sansedoni Aless., Sienna.—
Olive oil. 201
- 52 Ricasoli, Baron Bettino, Florence.—
Olive oil. 201
- 53 Botti, Alessandro, Chiavari, Genoa.—
—Olive oil. 201
- 54 Calamari, Pietro, Milan.—
Soaps. 201
- 55 Gianoli Brothers, Milan.—
Soaps. 201
- 56 Giuffrida, Leotta Giovanni, Catania.—
—Oil of sweet almonds. 201
- 57 Merlo, Bar. i Vincenzo, Palermo.—
Olive oil. 201
- 58 Sciacca della Scala, Baron, Paler-
mo.—Olive oil. 201
- 59 Martines, Filippo, Palermo.—Olive
oil. 201
- 60 Inguaggiato, Baron Croce, Palermo.—
—Olive oil. 201
- 61 Pacchiani, Eliseo, Passignano, Um-
bria.—Olive oil. 201
- 62 Rossi, Leopardi Cav. Cesard, Com-
iso, Syracuse.—Soaps. 201
- 63 Fazio, Domenico, Palermo.—Olive
oil. 201
- 64 Galli, Cesare, Florence.—Olive
oil. 201
- 65 Piacente, Francesco, Bari.—Olive
oil. 201
- 66 Agrarian Committee for Thirty Ex-
hibitors, Florence.—Olive oil. 201
- 67 Jatta, Antonio, Ruvo di Puglia.—
Olive oil. 201
- 68 Chamber of Commerce and Arts, of
Bari.—Olive oil. 201
- 69 Mazzullo, Cav. Luigi, Messina.—
Olive oil. 201
- 70 Di Salvo, Salvatore, Messina.
a Olive oil. 201
b Essences. 203
- 71 Agrarian Committee of Chiavari.—
Olive oil, soap. 201
- 72 Marzi Brothers, Poggibonsi, Sien-
na.—Olive oil. 201
- 73 Russo, Calogero, Termini, Palermo.—
—Olive oil. 201
- 74 Marchese della Favare, Palermo.—
Olive oil. 201
- 75 Martillaro, Mar. Carlo, Palermo.—
Olive oil. 201
- 76 Tucci, Savo Benedetto, Rome.—
Olive oil. 201
- 77 Agosti Brothers, Bagnoria, Rome.—
Olive oil. 201
- 78 Marini, Marq. Pietro, Rome.—Olive
oil. 201
- 79 Rotali, Francesco, Rome.—Olive
oil. 201
- 80 Isnardi, Pierre, Leghorn.—Olive
oil. 201
- 81 Conti, E., & Sons, Leghorn.—
Soaps. 201
- 82 Tarussi, Luigi, & Brothers, Leg-
horn.—Olive oil. 201
- 83 Generois, Felice, & Sons, Naples.—
Soaps. 201
- 84 Anselmi & Marassi, Naples.—
Oils. 201
- 85 Rocco, Francesco, Catania.—Olive
oil. 201
- 86 Rolando, Giacomo, Modena.—
Ink. 202
- 87 Mora, Domenico, Turin.—Chestnut
extract for dye. 202
- 88 Morandi, Pietro, Milan.—
Ink. 202
- 89 Bassolini, Vincenzo, Milan.—Vari-
ous colors. 202
- 90 Bonacina, Cesare, Milan.
a Varnishes, ink. 202
b Aromatic tooth paste. 203
- 91 Maranesi, Gaetano, & Masetti Bar-
tolomeo, Bologna.—Ink. 202
- 92 Gnocchi, Giovanni, Milan.—
Inks. 202
- 93 Scarselli, Benedetto, Rome.—Gru-
ma, incrustation from casks. 202
- 94 Ghibellini Brothers, S. Giovanni
in Persiceto, Bologna.—Varnish. 202
- 95 Santi, Amantini, Adamo, Florence.—
—Perfumery. 203
- 96 Lardera, A., Milan.—Perfum-
ery. 203
- 97 Cosentini & Caruso, S. Manno Mar-
chesato, Calabria Citra.—Extract of
licorice. 203
- 98 Scocchiolini, Adone, Rome.—Poma-
tum. 203
- 99 Pateguazza Brothers, N. & A.,
Rome.—Perfumery. 203
- 100 Bortolotti, Pietro, Bologna.—Fel-
sina water (for the toilet). 203
- 101 Antonelli, Cav. Alessandro, Bo-
logna.—Essence of lemon. 203
- 102 Alessi & Bonaventura, Messina.—
Essences. 203
- 103 Alessi, Gaetano, Messina.—Es-
sences. 203
- 104 Ottaviani Brothers, Messina.—
Essences. 203
- 105 Rizzuto Carmelo, Reggio-Calabria.—
—Essences. 203
- 106 De Sieto Brothers, Reggio-Calab-
ria.—Essences. 203
- 107 Siles, Ignazio, Reggio-Calabria.—
Essences. 203
- 108 Lacoria, Felice, Reggio-Calabria.—
—Essences. 203
- 109 Enological and Agrarian Society
of Acireale, Sicily.—Essence of lemon. 203
- 110 De Nava, Giuseppe di P., Reggio-
Calabria.—Essences. 203

Chemical Manufactures, Ceramics, Furniture, Woven Goods.

- 111 Mostardini, Adolfo, Florence.—
Perfumery. 203
- 112 Melissari, Guiseppe, Florence.—
Essences. 203
- 113 Pennise, Baron di Floristallo, Ca-
tania.—Boiled essence of lemon (agro). 203
- 114 Lavaggi, Francesco, Trofarello,
Turin.—Matches. 204
- 115 Dellachia, Ambrogio, Moncalieri,
Turin.—Wax and wood matches. 204

Ceramics—Pottery, Porcelain, Glass,
eto.

- 116 Trojani, G. Batta, Florence.—
Bas-relief in baked clay. 206
- 117 Pagliaccetti, Raffaello, Florence.—
Statues in baked clay. 206
- 118 Stock Company for Manufacturing
Bricks, Reggio, Emilia.—Bricks. 206
- 119 Tomei, Albani Franco, Pietra-
santa, Lucca.—Sample of pavements. 208
- 120 Pellas, Guiseppe, Florence.—Gal-
vano-plastic ornaments. 209
- 121 Bertini, Emilio, Pisa.—Crockery. 210
- 122 Miliani, Cesare, Fabriano, Ancona.
—Crockery. 210
- 123 Torelli, Jafet, Florence.—Crock-
ery. 210
- 124 Castellani, Torquato, Rome.—
Crockery. 210
- 125 Ferniani, Count Annibale, Faenza.
—Crockery. 210
- 126 Crockery Society of Farina, Faen-
za.—Artistic crockery. 210
- 127 Benucci & Latti, Pesaro.—Majoli-
ca vases and dishes. 211

Furniture and Objects of General Use
in Construction and in Dwellings.

- 128 Ammirati, Domenico, Palermo.—
Chairs. 217
- 129 Lopez, Salvatore, Palermo.—Stone
tables. 217
- 130 Coco, Salvatore, Palermo.—Ebony
furniture. 217
- 131 Cavallaro, L. & G., Palermo.—Me-
tallic beds. 217
- 132 Catalano, Antonio, Palermo.—Fur-
niture. 217
- 133 Martinotti, Luigi, Turin.—Carved
furniture. 217
- 134 Buzzi, Giberto Francesco, Varese,
Lombardo.—Marble furniture. 217
- 135 Lancetti, Federico, Perugia.—Fur-
niture. 217
- 136 Elli, Luigi, Milan.—Seats for thea-
tre. 217
- 137 Fava, Avo, Niccolo, Florence.—
Carved walnut furniture. 217
- 138 Castelvvedere, Luigi, Brescia.—
Metal candelabra and chased dish. 218
- 139 Rolandi, G. Batto, Milan.—Crys-
tals and glasses. 219
- 140 Grattarola, Cesare, Bologna.—Pic-
ture frames of other exhibitors' pic-
tures. (*In Art Gallery*). 220
- 141 Pontif. Oleographic Society, Bo-
logna.—Frames. 220

- 142 Saretti, Guiseppe, Palermo.—
Lamps. 223
- 143 Menici, Angiolo, Leghorn.—Show-
er bath. 226
- 144 Della, Casa Nicola, Baveno, Nova-
ra.—Granite cornice. 227
- 145 Bianchi & Molinari, Milan.—
Wooden floor. 227
- 146 Vajani, Pietro, Milan.—Window
blinds, curtains, etc. 227
- 147 Rizzi, Augusto, Milan.—Persian
window blinds. 227

Yarns and Woven Goods of Vegetable
or Mineral Materials.

- 148 Vecchiatti, Cesare, Florence.—
Green-weed (ginestro) products. 229
- 149 Polidori, Count Augusto, Anghiari,
Arezzo.—Prepared green-weed (gines-
tro). 229
- 150 Scurati, Manzoni De G., Biella,
Novara.—Skein of cotton. 230
- 151 Assetto di Graziani Brothers, Chi-
eri, Turin.—Cotton goods. 230
- 152 Madini, Augusto & Co., Bologna.
—Seamless bags. 230
- 153 Gentiluomi, I. V. & Co., Pisa.—Col-
ored cotton goods. 231
- 154 Meda, Bernardo, Monza, Milan.—
Colored calico. 232
- 155 Alessio Brothers, Milan.—Red cal-
ico. 232
- 156 Special Committee of Salerno.—
Linen goods. 233
- 157 Remaggi Brothers, Navacchio,
Pisa.—Linen goods. 233

Woven and Felted Goods of Wool, etc.

- 158 Caldara, Salvatore, Palermo.—
Cloths. 235
- 159 Mangeri, Antonino, Messina.—
Cloths. 235
- 160 Barbarule Brothers, Naples.—
Cloths. 235
- 161 Radieri Seniori Brothers, Gandino,
Bergamo.—Felted flannel and cloth. 235
- 162 Barbarulo, Antonio, Peluzzano,
Salerno.—Cloths. 235
- 163 Correction Department of Salice-
to, Modena.—Cloths. 235
- 164 Assetto di Graziani Brothers, Chi-
eri, Turin.—Blankets. 237
- 165 Chapelle & Co., Turin.—Woolen
blankets. 237
- 166 Bass, Abrate, & Co., Turin.—Blan-
kets. 237
- 167 Woolen Manufactory of Borgo Se-
sia, Turin.—Worsted wool. 238
- 168 Bozzalla Gio & Son, Biella, Novara.
—Woolen goods. 238
- 169 Bozzalla, Antonio, & Brother, Cog-
giola, Novara.—Woolen goods. 238

Silk and Silk Fabrics.

- 170 Keller, Alberto, Milan.
a Raw silk. 242
b Woven silk. 245
- 171 Chiericoni, Ugolino, Messina.—
Cocoons. 242

Silk, Clothing, Jewelry, Fancy Goods, Stationery.

- 172 Giannotti, Giuseppe, Barga (Luc-
ca).
a Raw silk. 242
b Spun silk. 244
- 173 Diena, M. G., Modena.—Raw
silk. 242
- 174 Heir Salomon Sinigaglia, Lattes,
Turin.
a Raw silk. 242
b Woven silk. 245
- 175 Franzi Bros., Alzano Maggiore,
Bergamo.
a Raw silk. 242
b Woven silk. 245
- 176 Dalla Pozza, Filippo, Vicenza.
a Raw silk. 242
b Woven silk. 245
- 177 Frizzoni, Antonio F., Bergamo.
a Raw silk. 242
b Woven silk. 245
- 178 Meyer & Co., Milan.
a Raw silk. 242
b Spun silk. 244
- 179 Sciacca della Scala, Baron, Pa-
lermo.—Silk. 245
- 180 De Silvestri, Salvatore, Rome.—
Silk goods. 245
- 181 Cagliani, Leopoldo, Milan.—Silk
velvets. 247

Clothing, Jewelry and Ornaments,
Traveling Equipments.

- 182 Morandi, G. Montepulciano, Sien-
na.—Dress for lady. 250
- 183 Incerti Anselmo, Modena.—Knit
goods. 250
- 184 Comellini & Buratti, Bologna.—
Corsets. 250
- 185 Marchesini, Pietro, Bologna.—
Straw hats. 251
- 186 Ricci, Luigi & Sons, Florence.—
Straw hats. 251
- 187 Duranti, Agostino, Florence.—
Straw hats. 251
- 188 Angelucci, Gerolamo, Ancona.—
Shoes. 251
- 189 Lodi, G. Batta, Palermo.—Gloves. 251
- 190 Di Rosalia, Antonino, Palermo.—
Shoes. 251
- 191 Vinci, Melchiorre, Palermo.—
Shoes. 251
- 192 Petroli, Pietro, Pallanza.—Shoes. 251
- 193 Shoemakers' Co-operative Society,
Bologna.—Shoes. 251
- 194 Baccilieri, Lorenzo, late Gaet, Bo-
logna.—Gloves. 251
- 195 Bossi, Eduardo, Naples.—
Gloves. 251
- 196 De Notaris, Sigismundo, Naples.
—Shoes. 251
- 197 Calise, Tommaso, Ischia Island,
Naples.—Ladies' straw hats. 251
- 198 Rumieri, Gabriele, Naples.—Silk
and felt hats. 251
- 199 Casella, Guiseppe, Salerno.—
Shoes. 251
- 200 Moiraghi, Antonio, Turin.—
Shoes. 251
- 201 Bruzzesi, Giacinto, Milan.—
Shoes. 251

- 202 Scarselli, Benedetto, Rome.—
Straw hats and braided straw. 251
- 203 Tadei, Gaetano, Florence.—Straw
hats and braided straw. 251
- 204 Straw Hat Stock Co., Pianoro, Bo-
logna.—Straw hats and braided straw. 251
- 205 Santini Brothers, Florence.—
Straw hats and braided straw. 251
- 206 Benevolent Working Men's Asso-
ciation of Falerone.—Straw hats and
braided straw. 251
- 207 Angeli Candido, Reggio Emilia.—
Hats and braided straw. 251
- 208 Kubli, Gio Giacomo, Florence.—
Straw hats and braided straw. 251
- 209 Romani, Eugenio, and wife, Milan.
—Embroidered pictures. 252
- 210 Gerosa, Adele Educanda, Milan.
—Embroidered pictures and handker-
chief. 252
- 211 Stock Co. for Manufacturing
Laces, Venice.—Laces, old and new
style. 252
- 212 Bon Regina, Como.—Laces. 252
- 213 Gioiuzza, Guiseppe, Naples.—Jew-
elry and coral. 253
- 214 Melillo, Giacinto, Naples.—Jewel-
ry and coral. 253
- 215 Francati & Santamaria, Rome.—
Jewelry. 253
- 216 Garaldini, Ettore, Rome.—Gold
and silver jewelry. 253
- 217 Bellezza, Niccolo Aliss, Rome.—
Jewelry. 253
- 218 Accarisi, Guiseppe, Florence.—
Roman jewelry. 253
- 219 Jacobini, Raffe, & Giobbedio, Rome.
—Old precious stones. 253
- 220 Ponti, Rovera, & Co., Piaunza.—
Buttons. 254
- 221 Olivieri, Luigi, Venice.—Fancy
articles. 254
- 222 Forte, Emilio, Genoa.—Silver fili-
gree work. 254
- 223 Salvo, C., & Sons, Genoa.—Objects
in filigree and gold. 254
- 224 Righini Brothers, Turin.—Um-
brella and parasol. 254
- 225 Labriola, Luigi, Naples.—Tortoise-
shell work. 254
- 226 Castellani, Alessandro, Rome.—
Gold and silver articles. 254
- 227 Brusa, G. Batta, Venice.—Album. 255
- 228 Rossetti, Cav. Giacomo, Brescia.
—Album, with photographs. 255
- 229 Cavaleri, Avo. Michele, Milan.—
Album and miniatures. 255
- 230 Leoni, Angelo, Catania.—Sicilian
costumes. 257

Paper, Blank Books, Stationery.

- 231 Grassi, Francesco, Bologna.—Ver-
tical letter press. 258
- 232 Cartiera Italiana, Turin.—Paper
and envelopes. 259
- 233 Agosti, Agnes, Rome.—Paper em-
broideries. 259
- 234 Cattaneo, Alessandro & Brother,
Bergamo.—Common paper. 260

Stationery, Weapons, Medical Appliances, Hardware, Vehicles.

- 235 Vallini, Natale, Bologna.—Paper. 260
- 236 Miliani, Pietro, Faleiano, Marche.—Various kinds of paper. 260
- 237 Fornari, Antonio G. B., Fabriano, Ancona.
a Papers. 260
b Pasteboard. 262
- 238 Migliaccio, Raffaello, Salerno.—Paper. 260
- 239 Giordano, Scipione, Turin.—Blank form of contract for nurses. 261
- 240 Cassinara, Eugenio, Pavia.—Bill-heads. 261
- 241 Fagioli, Gaetano, Piacenza.—Paper boxes. 262
- 242 Muttura, Ing. Oreste, Piacenza.—Bricks of pasteboard. 263

Weapons, etc.

- 243 Comminassi Brothers, Brescia.—Needle-gun barrels. 265
- 244 Botti, Pietro, Brescia.—Gun. 265
- 245 Corica, Agostino, Messina.—Shot. 265

Medicine, Surgery, Prothesis.

- 246 Decol, Maria, Bologna.—Decotto (a medicine). 272
- 247 Garan, Salvatore, Milan.—Tamarind powder, extract to prevent sea sickness. 272
- 248 Morreale, Ettore, Palermo.—Medicinal liquors. 272
- 249 Margani-Valenti, Gaetano, Nisemi, Sicily.—Medicines. 272
- 250 Pagliaro, Domenico, St. Stefano Camostra, Palermo.—Medicines. 272
- 251 Pagliaro, Andrea, Mistretta, Messina.—Medicinal gelatines. 272
- 252 Valentini, Gottardo, Milan.—Medicines. 272
- 253 Arrosto, Gioacchimo, Messina.—Citrates and medicines. 272
- 254 Spaddro, Grassi P., Catania.—Medicinal citrate. 272
- 255 Ponzoni, Luigi, Milan.—Hygienic liquors and medicine. 272
- 256 Menici, Angiolo, Leghorn.—Appliance for raising the sick. 276
- 257 Bernabei, Alessandro, Rome.—Tubes and metallic syringes. 276
- 258 Papini, Leopoldo, Florence.—Hernial truss. 276
- 259 Gramignani, Leopoldo, Ancona.—Dental prothesis. 277

- 260 Noel-Winderling Brothers, Milan.—Dental anatomy. 277
- 261 Testi, Ulisse, Bologna.—Dental machines. 277
- 262 Sirletti, Francesco, Rome.—Sets of teeth. 277

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 263 Guelpa-Piazza Brothers, Biella, Novara.—Gimlets. 280
- 264 Giulivo, B., & Co., Turin.—Iron and tin knives, forks, and spoons. 281
- 265 Ferrino, Cesare, Turin.—Sand linen and sand paper. 282
- 266 Bonini, Emilio, Pignone, Florence.—Articles in zinc. 283
- 267 De Poli Brothers, Vittorio, Treviso.—Bronze church bell. 283
- 268 Zalaffi, Benedetto, Sienna.—Iron work. 283
- 269 Parise, Achille, Sons, Naples.—Mechanical lock. 284
- 270 Cane, Geremia, Bologna.—Tools for umbrellas. 284
- 271 Namei, Giovanni, Florence.—Turned metallic articles. 284
- 272 Olivieri, Luigi, Venice.—Hardware. 284
- 273 Escoffier, Guiseppe Gio., Florence.—Mechanical articles. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 274 Giacomini, Luigi, & Co., Treviso.—Brushes. 286
- 275 Bargioni, Ferdinando, Florence.—Ropes of rush. 287
- 276 Chamber of Commerce of Syracuse.—Ropes. 287
- 277 Rosso, Leopardo Cav. Cesare, Comiso, Syracuse.—Ropes. 287
- 278 Vincenzi, Paolo, Carpi, Modena.—Corks. 289
- 279 Marchini, Cesare, Fiesole, Florence.—Straw works. 289

Carriages, Vehicles, and Accessories.

- 280 Saretti, Giuseppe, Palermo.—Lamps for carriages. 292
- 281 Locati, Cav. Alessandro, Turin.—Carriages. (*In Annex.*) 292
- 282 Mainetti, Francesco, Milan.—Carriage (landau). (*In Annex.*) 292

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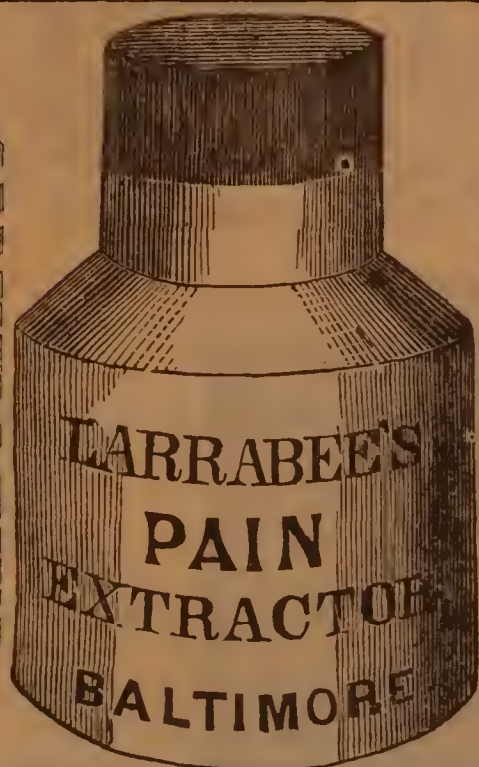
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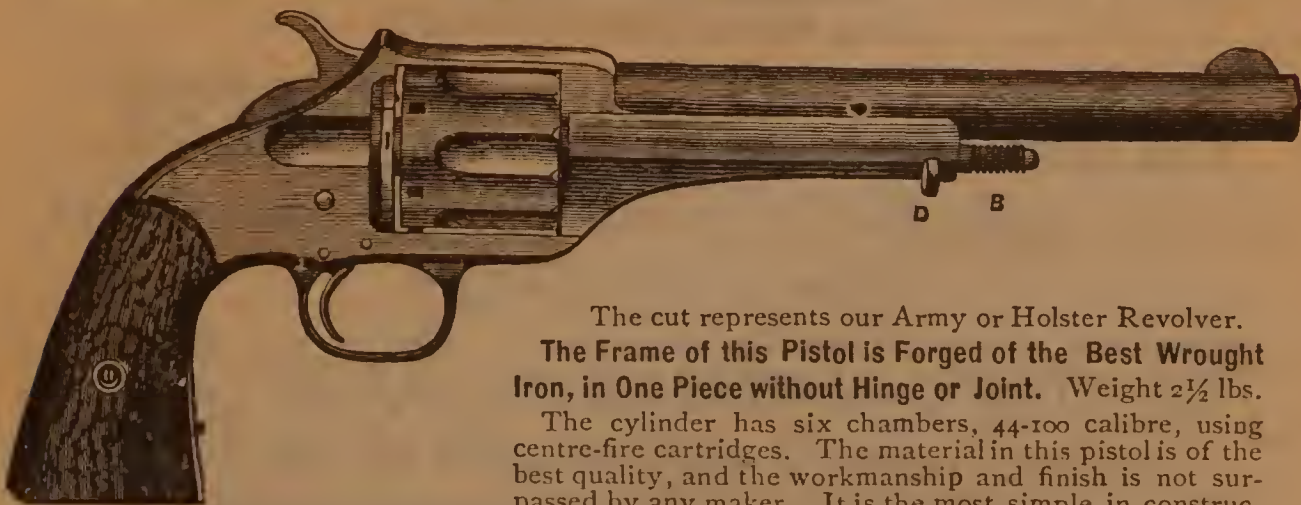


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EGYPT.—STATISTICAL PREFACE.

THE territories under the rule of the sovereign of Egypt, including those on the Upper Nile and Central Africa, are vaguely estimated to embrace an area of 4,777,830 square kilometres, and to be inhabited by a population of 16,952,000, of whom about one-third are in Egypt proper. The following tabular statement gives the area and population of the various divisions of the kingdom, and its recent annexation, according to government estimate, of the year 1875:

DIVISIONS.	AREA, SQ. KILOMETRES.	POPULATION.
Egypt proper,	550,630	5,252,000
Nubia,	864,500	1,000,000
Former kingdom of Ethiopia,	2,918,000	5,000,000
Darfur, and other annexed territories,	444,700	5,700,000
	<hr/> 4,777,830	<hr/> 16,952,000

The great physical peculiarity of Egypt is the absence of rain, the land being only irrigated by the annual overflow of the Nile. The climate is remarkably mild and sound, especially south of the Delta; and in the desert, from Cairo to Alexandria, the air contains more moisture than to the south. From the middle of August to December, west winds prevail; east winds from that time till March; after that, unhealthy south winds or Khamsin till June; and from June till August the north or Etesian winds. Earthquakes are occasionally felt, and the temperature varies from 84° F. to 32°. The most remarkable phenomenon is, however, the regular increase of the Nile, fed by the fall of the tropical rains, which commence in 11° north latitude, in the spring; and falling first into the White, and then Blue Nile, reach Egypt in the middle, and the Delta in the end of June. In the middle of July, the red water appears, and the rise may be dated from that time—it attains its maximum at the end of September, and begins to decline visibly in the middle of October, and subsides to its minimum in April. At the end of November, the irrigated land has dried, and is sown, and is covered with green crops, which last till the end of February. In March is the harvest. The state of the Nile, in fact, marks the season more accurately than the variation of temperature. Egypt is by no means remarkably healthy, as, in addition to the visitations of plague and cholera, ophthalmia, diarrhoea, dysentery, and boils often prevail, and European, and even Nigritic races cannot be acclimatized.

Many of the European trees and plants are found in Egypt; the date-palm, the doom-palm, the sycamore, acacias, tamarisks, etc., are among its more peculiar botanical productions; also the papyrus, which anciently supplied material for paper, and the lotus or water-lily of the Nile. The extensive culture of papyrus has been, in modern times, replaced by that of the sugar-cane, cotton, indigo, and tobacco, and the plant has almost disappeared. Gourds and melons have always abounded. To the wheat and barley of antiquity have been added maize and durra. Egypt is very deficient in timber trees. The rocks of Egypt afforded the stones used in its edifices and sculptures; granite, syenite, basalt (at Assouan), breccia (in the Cossier Rood), porphyry (from the quarries of Gebel Doshan, opened in the

reign of the Emperor Claudius), sandstone, and limestone. Alabaster (found at Cel-el-amarna) has been used from the earliest periods to the present day. Emeralds are produced by the mines of Gebel Zabara; salt, natron, and—since 1850—sulphur, are among the other mineral productions of Egypt.

Egypt proper is divided into three great districts, namely: Masr-el-Bahri, or Lower Egypt; El-Wustani, or Middle Egypt; and El-Said, or Upper Egypt—designations drawn from the course of the river Nile. These three geographical districts, subdivided into eleven administrative provinces, had, according to an enumeration made by the government in March, 1872, a rural population of 4,603,660, and an urban population of 648,340, dispersed over six towns, as follows:

Cairo,	349,983	Tanta,	28,500
Alexandria,	212,054	Rosetta,	15,002
Damietta,	29,383	Suez,	13,498

The Khedive is absolute sovereign or king. The administration is carried on by a Council of State of four military and four civil dignitaries.

The revenue of Egypt for the financial year ending September 10th, 1874, was calculated in the official budget at 1,982,394 purses;* the expenditures at 1,763,128 purses.

The public debt of Egypt consists chiefly of foreign loans. These are divided into two classes, namely, general loans, contracted by the State, and loans of the Khedive, as greatest of land-owners, raised on his individual responsibility.

The following table shows the actual state of the debt:

Funded debt,	£49,270,380
Floating debt,	7,600,000
	£56,870,380
Personal debt of the Khedive,	13,174,360
Total,	£70,044,740

The army is raised by conscription. It consisted, in January, 1875, of four regiments of infantry, of 3000 men each; of a battalion of chasseurs, of 1000 men; of 3500 cavalry, 1500 artillery, and two battalions of engineers, of 1500 each. There are, besides, two regiments of black troops, of Sudan, numbering 5000 men.

The Egyptian navy comprised, in 1875, 7 ships of the line, 6 frigates, 9 corvettes, 7 brigs, 18 gunboats and smaller vessels, and 27 transports.

The commerce of Egypt is very large, but consists, to some extent, of goods carried in transit. The total exports for the year 1873 amounted to about 1,450,000,000 piastres the imports to about 600,000,000 piastres. The merchant navy, in 1872, comprised 585 vessels of a total burthen of 59,874 tons.

The commerce of the world has been greatly benefited by the Suez Canal, which connects the Mediterranean with the Red Sea. Starting from Port Said, forty miles east of the Damietta mouth of the Nile, it proceeds across the isthmus and through lakes Menzaleh, El Ballah, and Timsah, on the shores of which latter stands the new town of Ismailia, and through the Bitter lakes to Suez. Its total length is 92 miles. Its actual width over the greater part of its length, does not permit of two vessels passing or crossing each other in the canal itself; but there are numerous sidings, by which vessels are enabled to cross one another; vessels measuring 430 feet in length and drawing 25 feet 9 inches of water have passed safely through the canal. Its actual cost, according to the report for the year 1875, was £17,518,729, exclusive of £1,360,000 bonds issued to pay for coupons on shares in arrear during part of the period of construction.

* 1 purse = 500 piastres = \$25 gold

The number and tonnage of vessels which passed through the canal in each of the five years, 1870 to 1874, were as follows :

YEAR.	VESSELS.	TONNAGE.
1870,	491	436,618
1871,	761	761,875
1872,	1082	1,439,169
1873,	1171	2,085,270
1874,	1264	2,423,672

Egypt had, on the 1st of January, 1875, a railway system of a total length of 955 English miles, open for traffic, with 502 miles under construction. With the exception of a short line of about 5 miles, all of the Egyptian railways are State property.

The telegraphs of Egypt were, at the commencement of 1875, of a total length of 4094 miles, the length of wires being 8690 miles. The whole of the telegraphs are State property.

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COLLECTIVE EXHIBIT.

Mining.—Manufactures.

Minerals, Ores, Building Stones, Mining Products.

- 1 National Museum.
a Rough gold dust, petrified wood. 100
b Rough, hewn, and polished marbles, alabaster, and limestones. 102
c Crude rock of lime, cement, burned lime, and plaster. 103
d Clays and materials for manufacturing porcelain and faience. 104
e Sand. 106
f Soil and water. 107

Metallurgical Products.

- 2 National Museum.
a Solid rough gold pieces. 110
b Iron. 111

Chemical Manufactures.

- 3 National Museum.
a Chemicals of all kinds and pharmaceutical preparations. 200
b Prepared oils, solid and liquid. 201
c Flavoring extracts, solid and liq 203

Ceramics, Pottery, Porcelain, etc.

- 4 National Museum.
a Bricks from Lower Egypt. 206
b Porcelain tiles. 208
c Egyptian earthenware from Upper Egypt. 210

- 5 Mr. Brugsch Bey, of Cairo.
a Majolica ware in different designs. 211
b Porcelain of all kinds. 213

Furniture and Objects of general use in Construction and in Dwellings.

- 6 Mr. Parvis, of Cairo.—Oriental drawing-room furniture. 217
- 7 National Museum.
a Table furniture of porcelain, solid gold and silver ware, coffee sets and vessels of brass. 218
b Utensils for kitchen, and tinware. 224

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 8 National Museum.
a Coarse fabrics of rattan, bark, palm-leaf, grass, and rushes. 229
b Cotton fabrics, unbleached, bleached, and dyed. 231
c Linen fabrics, uncolored and dyed, and linen canvas and duck for awnings and tents. 233

Woven and Felted Goods of Wool and Mixtures of Wool.

- 9 National Museum.
a Fabrics of wool, fancy cassimeres. 235
b Flannels. 236
c Robes. 237
- 10 National Museum.—Collection of Brussels carpets, Melton and tapestry, from wool and camels' hair. 239

Silk and Silk Fabrics, and Mixtures in which Silk is the predominating material.

- 11 Mr. Tramóntino, of Cairo.—Cocoons and raw silk. 242
- 12 National Museum.
a Twisted silk in spools and skeins. 243
b Woven silk, lute-strings, satins, and foulards. 245
c Woven figured silk goods. 246
d Fancy silk and velvet ribbons. 248

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 13 National Museum.
a Dress goods for men's and women's wear, with gold and silver trimmings. 250
b Ostrich and marabout feathers, hats, and boots; women's shoes embroidered in velvet, silk, gold, and silver. 251
c Silk dress trimmings and embroideries, woven with gold and silver. 252
d Turquoises, jewelry, and ornaments worn upon the person. 253
e Fancy articles, dress adornments, fans, walking canes, sun shades, and pipes of all descriptions, with gold, silver, and silk wove ornaments. 255
f Fancy leather-work. 255
g Historical collection of the national costumes from the new Provinces of Abyssinia and of the Soudan. 257

Paper, Blank Books, and Stationery.

- 14 National Museum.
a Stationers' articles of the Orient. 258
b Writing paper. 259

Military and Naval Armaments, Ord- nance, Firearms, and Hunting Ap- paratus.

- 15 National Museum.—Swords, spears, and dirks. 268

Manufactures, Education and Science, Art, Agriculture

- 16 Mr. F. P. Cassegrain, of Cairo.—Hunting firearms of a special pattern. 269

Medicine, Surgery, Prothesis.

- 17 National Museum.—Medicinal plants. 272
- 18 National Museum of Egypt, and Mr. Zucchini, of Cairo.—Veterinary instruments. 276

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 19 Mechanic Institute of Boolak.—Iron hardware for different mechanical purposes. 284

Carriages, Vehicles, and Accessories.

- 20 National Museum of Egypt, and Mr. Zucchini, of Cairo.—Furniture for horses and mules, harness and saddlery, ornamental mule blankets, and silk woven saddle blankets. 296

Educational Systems, Methods, and Libraries.

- 21 Ministry of Public Instruction.—Maps, charts, penmanship, drawings of pupils' work and course of study in water colors, from the public schools and academies. 300
- 22 National Museum.
a Map of Egypt and the new annexed provinces. 300
b Mechanical instruments executed by scholars at the Polytechnic school. 302
c Text-books and apparatus. 306
- 23 Mr. Onsy, of Cairo.—Types and books for the education of the blind. 303
- 24 Ministry of Public Instruction.
a College and school statistics and educational reports of Egypt. 304
b Statistical reports. 305
- 25 Messrs. Moures & Co., Cairo, and Ministry of Public Instruction.—Printed works, school and text books, and dictionary, from the public schools of Egypt; literature in the Arabic language, newspapers, and periodical literature. 306

Institutions and Organizations.

- 26 National Museum.—Ethnographical collection and publications. 312

Scientific and Philosophical Instruments and Methods.

- 27 National Museum.
a Egyptian weights and measures. 322
b Musical instruments from Egypt and the provinces of Soudan. 327

Engineering, Architecture, Charts, Maps, and Graphic Representations.

- 28 National Museum.—Maps of railways, roads, telegraphs, and postal service; topographical maps and charts. 335

Physical, Social, and Moral Condition of Man.

- 29 National Museum.—Collection of Egyptian gold, silver, and copper coins. 344

Sculpture.

- 30 National Museum.—Plaster casts from Egyptian monuments. 400
- 31 National Museum.
a Stones with ancient Arabic inscriptions. 401
b Hammered relief works in copper, and collection of plates, trays, and vases of the modern time of Egypt. 403
- 32 Mr. Vegis, Cairo.—Repoussé and rehaussé work in copper and iron of the ancient Arabic time. 403
- 33 National Museum.—Specimens of "Mousharabie" window patterns in wood and ivory, engraved wood. 405

Painting.

- 34 National Museum.
a View of Cairo, water colors, executed by Mr. Weidenbach, Berlin. 411
b Painted water bottles. 413

Engraving and Lithography.

- 35 H. Ravon, Staff-officer National Museum.—Drawing in ink of the citadel of Cairo, list of the names of the caliphs and sultans who have reigned in Egypt, from Omar to Ismail Pacha, Khedive of Egypt, list of the names of Pharaohs. 420

Photography.

- 36 National Museum.—Collection of photographs, views of public works, costumes, scenery, panorama, and a collection of albums. 430

Industrial and Architectural Designs, Models, and Decorations.

- 37 National Museum.—Collection of Arabic ornaments, (plaster and zinc casts, painted and gilt), from time of the caliphs. 443

Decorations with Ceramic and Vitreous Materials, Mosaic, and Inlaid Work.

- 38 National Museum.
a Ancient glass lamps from the mosques. 451
b Woodwork inlaid with ivory. 452

Arboriculture and Forest Products.

- 39 National Museum.
a Collection of woods from Egypt and the annexed provinces, cotton tree. 600
b Materials for dyeing and other industrial purposes. 602
- 40 National Museum and Mr. Heller.—Samples of gums. 603

Agricultural Products.

- 41 National Museum.
a Cereals. 620
b Legumes—beans, lentils, etc. 621
c Tuberculous alimentaries. 622
d Tobacco. 623
e Seeds of cotton. 624

Water Animals, Fish Culture and Apparatus.

- 42 National Museum.
a Crocodiles. 637
b Pearls. 64

Agriculture.

Animal and Vegetable Products.

43 National Museum.

- a* Samples of butter. 651
- b* Samples of grease, colored hides, skins, collection of hippopotamus and rhinoceros horns, tusks of elephants and hippopotami. 652
- c* Ostrich eggs and feathers. 653
- d* Edible pulps, seeds, fruits, pastes, and confections, dried fruits and vegetables. 656
- e* Flour and rice. 657
- f* Starches. 658
- g* Sacchari-culture. 659

- h* Wines, alcohol, rum, and vinegar. 660
- i* Biscuits. 661

Textile Substances of Vegetable or Animal Origin.

- 44 Estate of the Khedive.—Collection of over 2000 cotton samples, representing the crops of eight years, with classification and price of sale in Egypt and England. 665
- 45 National Museum.—Textile fibres, raw and manufactured, cords and ropes, flax. 666

TUNIS.—STATISTICAL PREFACE.

TUNIS, a country of Africa, and one of the Barbary States, is bounded on the north by the Mediterranean, on the west by Algeria, on the south by the Desert, and on the east by Tripoli and the Mediterranean. Its greatest length from north to south is about 440 miles; its average breadth, 160; area, upwards of 75,000 square miles; population, according to latest authorities, 1,200,000. Tunis is traversed by branches of the great Atlas range, which, in fact, has its proper termination here. The northern coast is rocky and steep, with numerous bays, of which the largest is the Gulf of Tunis; and two of its promontories, Capes Blanco (Ras-el-Abid) and Bon, are the most northern in Africa. The eastern coast, on the other hand, is flat, sandy, and infertile, like that of Tripoli, but has two large gulfs, Hammamet and Cables. The southern part of 'Tunis' belongs to the desert steppe known as Belud-el-Jerid. There is only one fresh water lake of any consequence, that of Biserta or Bensart, near the north coast. The brooks and torrents of Tunis either lose themselves in the sand, or find their way to the sea after a short course. None are navigable. The longest is the Mejerdah, which flows in a generally northeastern direction into the Gulf of Tunis. Other streams are the Ved-el-Milianah and the Ved-el-Kebir. There are several mineral springs in the country. The climate of Tunis is fine, and the soil exceedingly fertile, so that, in spite of a very poor knowledge of agriculture, wheat, barley, maize, dhurra, pulse, olives, oranges, figs, grapes, pomegranates, almonds, and dates are abundantly produced. The culture of oil is more attended to, and is very lucrative. Great herds of cattle are fed on the plains; the sheep are famous for their wool; and the horses and dromedaries are no less celebrated. The chief mineral products are sea-salt, saltpetre, lead ore, and quicksilver. In the vicinity of the sea-coasts, considerable manufacturing and trading industry is manifested, more particularly in the cities of Tunis and Susa. Wool, olive oil, wax, honey, soap, hides, coral, sponges, dates, wheat, and barley are the principal exports. Cloth, leather, silks, muslins, spices, cochineal, and arms are transported by means of caravans to the interior of Africa, whence in exchange are brought for exportation to European and other countries, senna, gums, ostrich feathers, gold, and ivory. Total exports in 1874, valued at 28,815,358 francs; imports, 25,193,785 francs. During the same year the entries at the port of Tunis (Goulette) were 779 vessels, 116,927 tons burthen; departures, 768, of 108,031 tons burthen.

The Bey of Tunis receives his investiture from Constantinople; without the Sultan's authority he can neither declare war, conclude peace, nor cede territory; the Sultan's name must appear on all the coinage; the army must be at the disposal of the Sublime Porte. In internal matters the power of the Bey remains absolute.

The Tunisian army comprises about 4000 regulars, 5000 Karouglis (descendants of the Turkish janissaries), 5000 Zouaves (infantry), and 1500 spahis (cavalry). In

time of war the irregular cavalry can be increased to about 3000. The navy consists of two vessels, carrying 10 guns, and crews aggregating 250 men. The merchant navy comprises 300 vessels, ranging from 10 to 150 tons burthen.

There are about forty miles of railways in operation. There is at Tunis, a French, and also an Italian post office.

French telegraph lines connect the city of Tunis with various towns within the borders of the regency, as well as with Algiers and Europe.

Commission from TUNIS to the International Exhibition :

HIS EXCELLENCY SIDI HEUSSIM, General of Division, Minister of Instruction and Public Works, President.

G. H. HEAP, U. S. Consul, Resident Commissioner.

TUNIS.

(*South of South Avenue, Columns 10 to 14.*)

COLLECTIVE EXHIBIT.

Manufactures, Science.

Chemical Manufactures.

- 1 His Highness Sidi Mohammed Essadok, Bey of Tunis.—Essences. 203

Ceramics, Pottery, Porcelain, Glass, etc.

- 2 Valensi, M., Tunis and Paris.—Pottery. 206

Furniture and Objects of General Use in Construction and in Dwellings.

- 3 Bacri, H. and Solomon, Tunis and Paris.—Inlaid furniture. 217

- 4 Valensi, M., Tunis and Paris.
a Inlaid furniture. 217
b Brackets. 220

- 5 His Highness Sidi Mohammed Essadok, Bey of Tunis.—Gilt brackets. 220

Woven and Felted Goods of Wool and Mixtures of Wool.

- 6 His Highness Sidi Mohammed Essadok, Bey of Tunis.
a Woolen blankets, shawls. 237
b Carpets, rugs. 239

- 7 Bacri, H. and Solomon, Tunis and Paris.
a Shawls. 237
b Oriental carpets. 239

- 8 Valensi, M., Tunis and Paris.
a Shawls. 237
b Carpets. 239

Silk and Silk Fabrics, and Mixtures in which Silk is the predominating Material.

- 9 His Highness Sidi Mohammed Essadok, Bey of Tunis.—Woven silks. 245
10 Bacri, H. and Solomon, Tunis and Paris.—Hangings. 246

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 11 His Highness Sidi Mohammed Essadok, Bey of Tunis.
a Jewelry. 253
b National costumes. 257

- 12 Bacri, H. and Solomon, Tunis and Paris.
a Bournous. 250
b Tunisian embroideries. 252
c Oriental jewelry. 253

- 13 Valensi, M., Tunis and Paris.
a Jewelry. 253
b Oriental manufactures generally. 254
c Tunisian costumes. 257

Military and Naval Armaments, Ordnance, Firearms, and Hunting Apparatus.

- 14 His Highness Sidi Mohammed Essadok, Bey of Tunis.—Arms. 265
15 Bacri, H. and Solomon, Tunis and Paris.—Arms. 265
16 Valensi, M., Tunis and Paris.—Arms. 265

Carriages, Vehicles, and Accessories.

- 17 His Highness Sidi Mohammed Essadok, Bey of Tunis.—Saddlery. 296

Scientific and Philosophical Instruments and Methods.

- 18 Valensi, M., Tunis and Paris.—Musical instruments. 327

Physical, Social, and Moral Condition of Man.

- 19 His Highness Sidi Mohammed Essadok, Bey of Tunis.—Two Arab tents exhibiting the domestic life and customs of Arab sheiks and Bedouins. (*In l'ark.*) 342

ORANGE FREE STATE.—STATISTICAL PREFACE.

THE republic of the Orange Free State is situated on the northeast boundary of Cape Colony, and is bounded as follows: On the west and northwest by the territory claimed for the chief, Nicholas Waterboer, under the name of Griqualand West, and by Betchuanaland, respectively, on the north and northeast by the Transvaal republic, on the east by the colony of Natal, and on the south by British Basutoland, the Native Reserve Lands, and the Cape Colonial divisions of Albert and Colesberg.

Its area is roughly taken to be about 70,000 square miles, but no accurate computation has hitherto been made, and the probability is that the actual extent will be found considerably greater.

The country consists of extensive undulating plains, which slope from the great Watershed, northward and westward, respectively, to the Vaal and Orange rivers, and is intersected at varying intervals by the Wilge, Rhenoster, Valsch, Vet, and Riet rivers, all of which empty their waters into the Vaal river, and the Caledon river, which empties into the Orange river. The courses of the large rivers are extremely tortuous and hollow, their banks being for the greater part very precipitous, and generally lined with water-willow, mimosa, and other trees indigenous to this country. The streams are usually fordable; during the rainy season, however, they become swollen and impassable.

The Orange Free State is, for the greater part, a grazing country, and though agriculture is everywhere attended to on a larger or smaller scale, according to the natural capabilities of the farms, still it is chiefly in the southern and eastern districts that it is carried on as the principal source of production, and it is almost exclusively from the districts of Rouxville, Lady Brand, Winburg, Bethlehem, and Harrismith, that grain is brought into the markets of the other districts.

Neither is it altogether without mineral wealth, as diamonds, rubies, and other precious stones have been discovered in various parts of the country. Coal also of a very good quality, and in paying quantities, has been found in the Winburg district, as well as on farms in the Lady Brand and Harrismith districts.

In the early days of this republic the distribution of animal life was a subject of great interest, from the fact of the immense variety of wild animals inhabiting the country. Even now the lion still frequents some sections of it. But, owing to the advance of civilization and human industry, all the larger animals, as the elephant, rhinoceros, hippopotamus, and giraffe, have retreated far away. Upon its vast undulating plains, however, a large and splendid variety of the antelope tribe roams in countless numbers. The country being favorable for the rearing of horses, cattle, and woolled sheep, the number of the latter contained therein may be estimated by millions.

Birds abound in great variety, particularly those of the larger kinds, among which might be enumerated the ostrich, eagle, vulture, pelican, hawk, and various species of crane.

The staple articles of export from the Orange Free State are wool and skins, and of late years diamonds and other precious stones, while owing to the mining population in the disputed territories along the Vaal river, a large trade in grain and other agricultural produce has been productive of great wealth to the country.

From the same cause, although more indirectly, trade in all articles of import, such as ironware implements, and manufactures in woolen, cotton, and silk goods, and articles for consumption, either as necessaries or luxuries, has received a great stimulus, and the commercial community is to all appearance in a healthy and prosperous condition.

The average height of the Orange Free State above the level of the sea is about 5000 feet, and the climate is generally salubrious. The winter here is cold but dry, the summer usually warm and moist, though droughts are sometimes experienced in the summer months. The air, however, is healthy and dry, as a rule, and this is particularly felt at Bloemfontein and its vicinity; consequently numbers of invalids suffering from pulmonary affections resort to Bloemfontein, and experience much benefit from a residence in this part of the country.

In other respects it has been noticed that the changes of the seasons are to a greater or less degree, according to their duration, accompanied by a greater liability to colds and fevers, generally of a typhoid type, and inflammatory affections, especially amongst children.

The government of the Orange Free State is republican, and its constitution vests the legislative powers in the Volksraad, the members of which are elected by their constituents for four consecutive years. The whole number of representatives (there being one for each chief town of a district, and one for each field cornetcy) is fifty-two. Of this number, the half retire by rotation every two years, and a new election takes place to fill up the vacancies.

The educational department of the country is only now receiving that vital attention which a subject of so vast importance to any country ought to have; and the legislature has only of late years been impressed with the absolute necessity of placing this department on the best possible footing. Accordingly, a fund is gradually being raised for educational purposes, which in 1876 will place at the disposal of the government an amount of £56,000.

Meantime, in accordance with an order made in 1872, an inspector of education has been appointed, who has already entered upon the task of remodeling the whole educational system. It is only right, nevertheless, to state that a government allowance of £90 a year has for years past been given to each district town, on condition of its subscribing at least one-half more, and attempts to establish good schools have everywhere been made by the district school committees, comprising the Landdrost, Dutch Reformed Church, and three elected members, with varying success in some places, but in others only to meet with failure, which is principally to be attributed to the defective system hitherto pursued.

The principal support hitherto afforded by the government consists in the liberal allowances made for the salaries of teachers in the Grey College; but owing to the short time that has elapsed since the arrival of one of them, and various other circumstances beyond the control of the government, the desired results are still to be looked for. Very praiseworthy efforts have also been made on behalf of education by the Anglican Church, in schools established at Bloemfontein and at Smithfield, and this latter has already shown very satisfactory results.

The revenue of the State, for the year 1872-73, was £112,040; the expenditure, during the same year, £102,142.

The government lands of the Orange Free State are still very considerable, though as nought compared with their original size, owing to the sales of farms which have been held from time to time. The value of fixed property of all kinds has increased greatly within the last few years. Even in the districts of Harrismith and Kroonstad, where land formerly was almost valueless, farms are now eagerly sought after, and change hands at very high rates. The average price of land throughout the whole State may now be fixed at 10s. per morgen. A rough estimate fixes the number of farms throughout the country as between 6000 and 7000. Fixed property changes ownership by registration. The population of the State is estimated at about 75,000 white, and 25,000 colored or native.

ORANGE FREE STATE.

(South of South Avenue, Columns 2 to 5.)

COLLECTIVE GOVERNMENT EXHIBIT.

Minerals, Native Utensils, Animal and Vegetable Specimens.

Diamonds in the rough, from the diamond fields of the Orange Free State.	100	Petrified wood.	600
Diamondiferous soil, with a diamond in it.	100	Stuffed birds.	635
Copper and iron ore, chlorsastrolite, and magnesita.	100	Butterflies and other insects.	638
Coal.	101	Tusks of ivory.	652
Pebbles accompanying the diamond.	102	Gemsbuck, roorbuck, rietbuck, and hartebeeste horns.	652
Kaolin.	104	Koodoo cow hides.	652
Springbuck mats.	239	Hartebeeste and blesbuck skins, tanned.	652
Angora, blesbuck, and jackal ka-rosses.	239	Shambucks, long and short.	652
Mohair, Angora goat hair, washed and unwashed white wool.	240	Rhinoceros hide flexible rods, reimes, thongs, and girdles.	652
Boots of native manufacture.	251	Ostrich feathers and eggs.	3
Pipes of native manufacture.	254	Bird plumage, natural.	653
Baskets of native manufacture.	289	Cream tartar fruit, dried fruit, and sumach.	656
Harnesses and whips.	296	Flour, meal, wheat, and Kaffir corn.	657
Blue gum, olive, and thorn woods.	600	Model of transport wagon.	682

GRAND DUCHY OF LUXEMBURG.

COLLECTIVE EXHIBIT.

Cements, Clothing, Vegetable Products.

Ceramics—Pottery, Porcelain, Glass, etc.	4 Boot Manufactory of Luxemburg.—Boots.	251
1 Utschneider & Jaunez, Wasserbillig.—Cement products of Wasserbillig.	Animal and Vegetable Products.	
Clothing, Jewelry, and Ornaments, Traveling Equipments.	5 Michaelis, Frederic, Luxemburg.—Bottle of vinegar.	660
2 Charles, Auguste, & Co., Bonnevoie, near Luxemburg.—Gloves.	6 Pauly, Bouthon, & Co., Distillery and Vinegar Manufactory.—Vinegar.	660
3 Mayer, Gabriel, Luxemburg.—Gloves.	7 Eichhorn, Gustav, Wormeldang.—Moselle wines.	660
	8 Nothing & Soupert, Limpertsberg, near Luxemburg.—Rose trees.	705

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CHINA.—STATISTICAL PREFACE.

THE following table gives the area and population of the various divisions comprising the Chinese empire :

	AREA IN ENGLISH SQ. MILES.	POPULATION.
China proper,	1,534,953	405,213,152
DEPENDENCIES.		
Mandchuria,	362,313	3,000,000
Mongolia,	1,288,035	2,000,000
Thibet,	643,734	6,000,000
Corea,	90,300	8,000,000
Lieukhien Islands,	2,310	
Liaotong,	2,982	1,000,000
Total,	3,924,727	425,213,152

China proper is included between 18° 15' and 43° 15' north latitude and 98° and 122° 40' east longitude. Its coast-line exceeds 2500 miles, and its land frontier 4400 miles. It is divided into eighteen provinces, and includes the two large islands of Formosa and Hainan. The administration of the empire is parceled out into separate governments, corresponding with the provincial divisions, each of which has a complete organization, exchequer, army, and naval force of its own. Besides providing for the cost of its own administration, each province is required to remit annually to Peking a certain portion of its revenue to meet the expenses of the court, central government, and garrison of Peking, as well as to provide for exigencies arising in other provinces, and for the requirements of the garrisons in Turkestan, Mongolia, and Mandchuria, which are administered by military governors.

According to the latest reports, the imperial army comprises a total of 850,000 men, including 678 companies of Tartar troops, 211 companies of Mongols, and native Chinese infantry, a kind of militia, numbering 120,000 men. The native soldiers do not live in barracks, but in their own houses, mostly pursuing some civil occupation.

The Chinese are pre-eminent for their indefatigable industry. Of the immense territory peopled by them, there is scarcely a rood of arable ground that is not assiduously cultivated. Unfortunately, however, their husbandry is, to a great extent, nullified by the rude and ill-adapted implements employed therefor. Scientific agriculture is but slightly advanced in China, although the Chinese system of land irrigation is superior to that of any other people. As a manufacturing nation the Chinese are highly distinguished; porcelain originated entirely with them, and the art of spinning silk they also gave to the West. The lacquered ware produced in China, though very beautiful, must be considered inferior to that of Japan, but in the more minute arts of carving and inlaying, the Chinese have no superiors. Their ivory and mother of pearl industry is too well known to need description. Gunpowder, though a Chinese invention, is little manufactured, and that little of indifferent quality. Paper is ingeniously made of various materials; it is, in general, thin, silky, and highly absorbent of ink.

Chinese trade has the peculiarity of being, for the most part, internal, the country supplying most articles of subsistence or luxury, and is carried on by means of canal and river navigation. The principal exports are tea, porcelain, raw and spun silk,

sugar, rhubarb, embroidery, lacquered wares, and carved articles of domestic ornament. The imports consist mainly of cotton and woolen goods, opium, raw cotton, furs, and edible birds' nests, which form an expensive luxury, and are held in high esteem. The total value of commodities exported from China, in 1865, reached the figure of \$173,609,085, as against imports of \$238,504,520. Of the exports, tea is the chief, showing a total quantity of 223,679,182 pounds shipped. The export of raw silk for the same year aggregated 40,726 bales, and of cotton, 35,855,792 pounds.

The grand canal, about 700 miles in length, has greatly facilitated the internal trade of the country. China is traversed in all directions by 20,000 imperial roads, most of which are badly kept. There is a postal service, but of a very rude kind.

Education, as the high road to official employment, to rank, wealth, and influence, is eagerly sought by all classes. Literary proficiency commands everywhere respect and consideration, and primary instruction penetrates to the remotest villages. Self-supporting day-schools are universal throughout the country, and the office of teacher is followed by a great number of the *literati*. Government provides state examiners, but does not otherwise assist in the education of the people.

The Chinese executive system is based on those noteworthy competitive examinations which are intended to sift out from the millions of educated Chinese the best and ablest for the public service.

Commisson from CHINA to the International Exhibition:

MR. JAMES HART.

MR. ALFORD HUBER, Former Commissioner of Customs.

MR. EDWARD B. DREW, Commissioner of Customs.

MR. J. L. HAMMOND, Commissioner of Customs.

MR. EDWARD CUNNINGHAM, Assistant Commissioner,

MR. W. W. PARKIN, " "

MR. F. P. KNIGHT, " "

CHINA.

(South of South Avenue, Columns 4 to 11.)

Minerals, Chemicals, Ceramics, Furniture, Woven Goods.

Minerals, Ores, Stone, Mining Products.		Ceramics—Pottery, Porcelain, Glass, etc.	
1 Harman, G., Swatow.—Petrification.	100	5 Imperial Maritime Customs.	
2 Imperial Maritime Customs.		a Bricks.	206
a Coal.	101	b Roof tiles.	208
b Granite stones.	102	c Collection of earthenware.	210
c Borax.	104	6 Tack Loong, Canton.	
d Gypsum.	107	a Earthenware ornaments, figures, etc.	210
		b Porcelain vases, flower-pots, tea set, cigar holders, etc.	213
Metallurgical Products.		7 Bean & Jardine, Kiukiang.—Porcelain vases, flower-pots, cups, etc.	213
3 Imperial Maritime Customs.		8 Fow Loong, Canton.—Porcelain vases, dinner service, etc.	213
a Silver leaf and imitation of gold leaf.	110	9 Hö Kan Cheu, Shanghai.—Collection of old china.	213
b Steel.	111	10 Hu Kwang, Yung Hang Chow.—Collection of old china porcelain.	213
c Tin foil.	113	11 Imperial Maritime Customs, Canton.—Porcelain vases, dinner, dessert, tea, and toilet sets, flower-pots, candle-holders, bowls, cuspidores, etc.	213
Chemical Manufactures.			
4 Imperial Maritime Customs.			
a Various seed, vegetable, and wood oils.	201		
b Varnish, indigo, and sundry other dyes and colors.	202		
c Sauce.	203		

Manufactures, Education and Science, Art, Agriculture.

- 12 Imperial Maritime Customs, Kiukiang.—Porcelain vases, cups, and bowls; plates, teapots, etc. 213
- 13 Imperial Maritime Customs, Shanghai.—Collection of old china. 213
- 14 Kopsch, H., Kiukiang.—Porcelain vases, cups, bottles, cups and plates, dessert dishes, goblets, etc. 213
- 15 Lovatt, W. N., Kiukiang.—Porcelain vases, flower-pots, garden seats, teacups, dessert dishes, goblets, etc. 213
- 16 Moore, C. F., Kiukiang.—Porcelain teapots, bottles, flower-pots, ornaments, etc. 213
- 17 Rose, S. C., Kiukiang.—Porcelain vases, flower-pots, jars, plates, dishes, cups, dinner sets, etc. 213
- 18 Tong Chock-hing, Kiukiang.—Porcelain vases, ornaments, dessert service, etc. 213
- 19 Toin Peh Mei, Kiukiang.—Porcelain vases, teacups, fruit stands, dinner sets, and screen. 213
- 20 Wadman, E., Ningpo.—Collection of old china vases. 213

Furniture and Objects of General Use in Construction and in Dwellings.

- 21 Fow Loong, Canton.—Blackwood furniture—tables, sofas, chairs, screens, cabinets, etc. 217
- 22 Imperial Maritime Customs, Canton.
a Blackwood, bamboo, rattan, and lacquered furniture. 217
b Rattan cradle, and children's chairs. 221
c Different kinds of lanterns. 223
- 23 Kopsch, H., Kiukiang.—Screens. 217
- 24 Lien Shing, Canton.—Lacquered furniture, chairs, and blackwood screens. 217
- 25 Sung Sing Kung, Ningpo.
a Carved furniture—beds, chairs, tables, bookcases, cabinets, etc. 217
b Carved picture and photograph frames. 220
- 26 Imperial Maritime Customs, Ningpo.
a Teakettles and food dishes. 224
b Washbasins. 226

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 27 Fergusson & Co., Chefoo.—Samples of straw braid. 229
- 28 Imperial Maritime Customs.
a Samples of grass cloth, rattan and coir matting, etc. 229
b Plain cotton fabrics. 230
c Printed cotton fabrics. 232
d Hemp cloth. 233

Woven and Felted Goods of Wool, etc.

- 29 Imperial Maritime Customs.—Felt rugs. 239

Silk and Silk Fabrics.

- 30 Fergusson & Co., Chefoo.
a Raw silk. 242
b Plain woven silks. 245

- 31 Imperial Maritime Customs, Shanghai.—Collection of reeled and re-reeled silks. 242
- 32 Hö Kan-cheu, Shanghai.—Plain woven silks. 245
- 33 Hu Kwang-Yung, Hangchow.—Plain woven silks. 245
- 34 Imperial Maritime Customs.
a Plain woven silks. 245
b Figured silk piece goods. 246
c Embroidered silk scarfs. 247
- 35 Fergusson & Co., Chefoo.—Figured silk piece goods. 246
- 36 Hö Kan-cheu, Shanghai.—Figured silk piece goods. 246
- 37 Hu Kwang-Yung, Hangchow.—Figured silk piece goods. 246
- 38 Wu, Shanghai.—Soochow gauzes. 247

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 39 Imperial Maritime Customs.
a Stockings. 250
b Shoes, hats, caps, etc. 251
c Fans, small articles of dress, pipes, smoking apparatus, etc. 254
- 40 Imperial Maritime Customs, Canton.—Collection of silk embroidered goods, shawls, slippers, and caps, bed and cushion covers, cloth, etc. 252
- 41 Sisters of Charity, Ningpo.—Embroideries. 252
- 42 Sung Sing Kung, Ningpo.—Satin embroideries. 252
- 43 Lien Shing, Canton.
a Jewelry. 253
b Fans and hand screens. 254
- 44 Moore, C. F., Kiukiang.—Jewelry and ornaments. 253
- 45 Ho a Ching, Canton.—Sundry carved fans. 254
- 46 Imperial Maritime Customs, Niuchwang.—Collection of furs and skins. 255
- 47 Imperial Maritime Customs, Shanghai.—Fancy leather work, trunks, and toilet boxes. 255

Paper, Blank Books, and Stationery.

- 48 Imperial Maritime Customs.
a Paper, knives, ink, pens, etc. 258
b Writing paper. 259
c Oiled and pith paper. 260
d Various colored paper. 264
- 49 Tong Chou Hing, Kiukiang.—Ink. 259

Medicine, Surgery, Prothesis.

- 50 Imperial Maritime Customs.—Collection of medicines, officinal and unofficial. 272

Hardware, Edge Tools, Cutlery, Metallic Products

- 51 Ho Kan Cheu, Shanghai.—Collection of old bronzes, vases, urns, etc. 283
- 52 Hu Kwang-Yung, Hangchow.—Collection of old bronzes, vases, urns, etc. 283
- 53 Imperial Maritime Customs.—Pewter ware, tea canisters, cups, pots, mugs, boxes, candlesticks, etc. 283

Agricultural, Animal, Vegetable Products.

54 Imperial Maritime Customs, Shanghai.—Collection of old bronzes, vases, urns, etc. 283

55 Wadman, E., Ningpo.—Collection of old bronzes, vases, urns, etc. 283

Fabrics of Vegetable, Animal, or Mineral Materials.

56 Imperial Maritime Customs.
a Cord, rope, twine, etc. 287

b Lacquer, rattan, and bamboo ware. 289

57 Ho a Ching, Canton.—Lacquer ware. 289

58 Lien Shing, Canton.—Lacquer and sandalwood ware. 289

Scientific and Philosophical Instruments and Methods.

59 Imperial Maritime Customs.—Collection of musical instruments. 327

Physical, Social, and Moral Condition of Man.

60 The Protestant Missionaries in China.—Publications. 348

Sculpture.

61 Grimm, B., Shanghai.—Collection of coins and medals. 401

62 Ho a Ching, Canton.—Carved ivory ware. 406

63 Imperial Maritime Customs, Canton.—Carved ivory and tortoise shell ware. 405

64 Lien Shing, Canton.—Carved ivory ware, etc. 405

65 Moore, C. F., Kiukiang.—Carved figure. 405

Paintings.

66 Hippiisley, A., Shanghai.—Water-color paintings on silk, for screens, painted by Wang Kieu-ting. 411

67 Imperial Maritime Customs.—Collection of ancient water-color paintings on silk and paper; pictures on pith paper. 411

Ceramic Decorations, Mosaics, etc.

68 Vo Chou, Canton.—Two cloisonné brass incense burners. 452

69 Moore, C. F., Kiukiang.—Enamel vase and bowl, idols, jade plate. 454

70 Vo Chon, Canton.—Bronze vases, incense burners, plates, etc. 454

Arboriculture and Forest Products.

71 Imperial Maritime Customs.

a Specimens of timber. 600

b Gallnuts and dyestuff. 602

c Camphor. 603

d Moss and fungus. 604

e Collection of nuts and seeds. 605

f Hemp. 606

72 Fergusson & Co., Chefoo.—Red dye-stuff. 602

Agricultural Products.

73 Fergusson & Co., Chefoo.

a Peas and beans. 620

b Tobacco. 623

74 Imperial Maritime Customs.

a Cereals. 620

b Leguminous plants. 621

c Ginger. 622

d Tobacco and opium. 623

e Seeds. 624

75 Imperial Maritime Customs, Shanghai.—Collection of teas. 623

Water Animals, Fish Culture, and Apparatus.

76 Imperial Maritime Customs.

a Dried fish. 642

b Clams, dried. 644

c Fish glue and sea blubber. 646

d Instruments and apparatus of fishing. 647

77 Imperial Maritime Customs, Tamsui.—Collection of sea shells. 645

Animal and Vegetable Products.

78 Imperial Maritime Customs.

a Seaweed. 650

b Leather, furs, skins, tallow, glue, etc. 652

c Honey and wax. 654

d Dried fruit. 656

e Flour. 657

f Vermicelli, macaroni, starch, etc. 658

g Sugar, etc. 659

h Wines, etc. 660

i Vegetable tallow and oil. 662

79 Fergusson & Co., Chefoo.

a Bean cakes. 657

b Vermicelli. 658

Textile Substances of Vegetable or Animal Origin.

80 Imperial Maritime Customs.

a Cotton. 665

b Hemp, coir, etc. 666

c Wool. 667

d Hair. 669

81 Fergusson & Co., Chefoo.—Sample of hemp. 666

JAPAN.—STATISTICAL PREFACE.

JAPAN proper comprehends four large islands, viz.: Nippon (the Japanese mainland), Sikok or Sikopf, Kiusiu, and Yesso, and extends from 31° to $45^{\circ} 30'$ north latitude. The empire of Japan includes about 3800 small islands and islets besides the four larger ones, and is situated between 26° and 52° north latitude, and 128° and 151° east longitude. It is bounded on the north by the Sea of Okotsk, on the east by the north Pacific Ocean, on the south by the eastern Sea of China, and on the west by the Sea of Japan. The islands of Japan appear to be of volcanic origin, and that part of the Pacific on which they rest is still intensely affected by volcanic action. Earthquakes occur very frequently in Japan, although certain parts of the country are exempt. Japan has been called the land of mountains: but though these are very numerous, and many of them volcanic, they are of moderate elevation, and rarely attain the limits of perpetual snow. The country generally is of moderate elevation, with fertile valleys, picturesque landscapes, and a coast indented with magnificent harbors; the soil is productive, rich in mineral wealth, and teeming with every variety of agricultural produce. Springs, lakes, and rivers are numerous; but the last, being sand-choked, are valuable chiefly for the purposes of irrigation.

Our knowledge of the climate of Japan is yearly increasing. June, July, and August are the months of rain, which sometimes descends in unceasing torrents. The months of October and November are the pleasantest and most genial of the twelve, when fine weather is enjoyed without the scorching heat of summer. The summers are very hot, and the winters in the northern parts almost Siberian; the thermometer rising to 96° in the shade in the former, and sinking to 18° below zero in the latter season. Alcock says: "The thermometer in the shade (during the summer) ranges from 70° to 85° , and averages 80° between the morning and the evening, while it is sometimes below 70° at night." Hurricanes and waterspouts are frequent; dense fogs hide the sun, sometimes for four or five days together; and about the change of the monsoons, typhoons and equinoctial gales frequently sweep the Japanese seas.

The following figures are furnished by the Japanese commission:

Area,	23,740 ris (the ri equals $2\frac{1}{4}$ miles).
Population.—Male,	16,891,729
Female,	16,408,946
Total,	33,300,675
Imports,	22,841,166.93 yens.*
Exports,	18,367,259.29 "
Revenue,	81,552,294. "
Expenditure,	79,881,820. "
Army,	42,073 men

The navy consists of 20 vessels, manned by 3757 men.

The country is rich in minerals, gold, silver, iron, sulphur, and especially copper abound. There are also large quantities of coal. Amongst the most remarkable of its vegetable productions is the camphor tree, the varnish or lacquer tree, the paper mulberry tree, the vegetable wax tree, the tea shrub, the tobacco plant, and the rice plant. The principal manufactures are those of silk and cotton. The internal trade is very extensive, and rigid regulations are in force to protect and encourage home industry. In the mechanical arts the Japanese have attained great excellence, especially in metallurgy, and in the manufacture of porcelain, lacquer ware, and silk fabrics. In some of these departments works are produced so exquisite in design and execution, as to more than rival the best products of Europe.

* The yen equals 99.7 cents gold.

The Japanese government is organized on a basis which is partly European. The Mikado is supreme in temporal and spiritual matters, but the work of government is carried on by the Great Council, which is divided into three sections, denominated Centre, Right, and Left. The Centre is composed of the Prime Minister, Vice Prime Minister, and five advisers. The left is made up exclusively of the Council of State, the functions of which are analogous to those of the French Conseil d'Etat, so far as the preparation and discussion of laws is concerned. The Right includes all the ministers and vice-ministers of eight departments into which the administration is divided. The ministers, either individually or united in a Cabinet, decide all ordinary questions; but points of real importance are reserved for the Great Council, presided over by the Mikado. The local administration in the provinces is in the hands of prefects, one of them residing in each of the 75 districts into which Japan is divided.

Education is very general in Japan. In 1871 a Ministry of Instruction was created, and as a result of its efforts, public primary schools are increasing rapidly, especially in the towns; but the movement is far more marked in the western provinces and on the coast than in the interior. Private schools are more abundant still, and any person being at liberty to establish them,—subject to a permission, which is always given,—they spring up with facility wherever wanted. In order to facilitate the acquirement of foreign languages, the government has engaged European professors, and has also sent, at public expense, a large number of students to America and Europe. The first line of railway, from Yokahama to Yeddo, 17 miles long, was opened for traffic on the 12th of June 1875, and other lines were in progress at that date.

The post office carried 17,095,842 letters in 1874. The number of post offices at that date was 3244.

Commission from the JAPANESE EMPIRE to the International Exhibition:

HIS EXCELLENCY OKUBO TOSHIMICHI, Minister of the Interior and Privy Counsellor, President.

HIS EXCELLENCY LIEUTENANT-GENERAL SAIGO YORIMICHI, Imperial Army, Vice-President.

MR. KAWASE HIDEHARU, Vice-President Bureau of Agriculture and Industry, Commissioner-General.

MR. TANAKA YOSHIO, Ministry of the Interior.

MR. SEKIZAWA AKEKIO, Bureau of Industry.

MR. YAMATAKA NOBUAKIRA, Bureau of Industry.

MR. SHIODA MASASHI, Bureau of Industry.

MR. ISHIHARA TOYOYASU, Bureau of Industry.

MR. ISHIDA TAMETAKE, Bureau of Industry.

MR. YAMAO TSUNETARO, Bureau of Industry.

MR. KUBO HIROMICHI, Ministry of the Interior.

MR. NOTOMI SKEJIRO, Bureau of Industry.

MR. SHIBATA HIRUSHI, Bureau of Industry.

MR. MAKIYAMA KOHEI, Bureau of Industry.

MR. ISHII YOSHITAKA, Bureau of Industry.

MR. ASAHI NOBORI, Ministry of the Interior.

MR. KAWARA NORITACHI, Bureau of Industry.

MR. SASASE MOTO AKIRA, Bureau of Industry.

MR. TAKEDA, Bureau of Agriculture and Industry.

MR. SUGIYAMA KATZUNARI, Bureau of Industry.

MR. HITAKA GIRO, Lieutenant of Imperial Army.

MR. OMORI ICHIU, Bureau of Agriculture and Industry.

MR. ASAMI TADATSUNE, Bureau of Agriculture and Industry.

MR. FUKUI MOKOTO, Bureau of Agriculture and Industry.

MR. FRITZ CUNLIFFE OWEN, Attache.

MR. TAWARA WAKICHIO, Attache.

JAPAN.

(From Nave to South Avenue, and from Columns 5 to 10.)

COLLECTIVE EXHIBIT.

Chemical Manufactures, Ceramics, Furniture, Woven Goods.

Chemical Manufactures.

- 1 The Chemistry Association, Kiyoto.
—Drugs and chemicals. 200
- 2 Kondo, M., Yoda, Y., Matsusaki, S.,
& Co., Tokio.—Soap. 201
- 3 Murakawa, D., Kiyoto.—Lead powder. 202

Ceramics—Pottery, Porcelain, Glass, etc.

- 4 Eraku, Z., Kiyoto.—Kiyoto porcelain. 213
- 5 Fukagawa, A., Fukami, S., Tsuji, K.,
Tedsuka, K., & Co., Arita, Province of
Hizen.—Arita porcelain. 213
- 6 Ida, G., Nagoya, Province of Owari.
—Owari or Seto porcelain. 213
- 7 Kanzan, D., Kiyoto.—Kiyoto porcelain. 213
- 8 Kiyomidzu, H., Kiyoto.—Kiyoto porcelain. 213
- 9 Kinkosan, S., Kiyoto.—Kiyoto faience. 213
- 10 Kiyomidzu, R., Kiyoto.—Kiyoto porcelain. 213
- 11 Kiyomidzu, K., Kiyoto.—Kiyoto faience. 213
- 12 Marunaka, M., Kanazawa, Province
of Kaga.—Kutani or Kaga faience. 213
- 13 Miyagawa, T., Yokohama.—Yokohama
porcelain and faience. 213
- 14 Nakashima, R., Kagoshima, Province
of Satsuma.—Satsuma porcelain. 213
- 15 Sato, M., Tokio.—Tokio porcelain
and faience. 213
- 16 Sefu, Y., Kiyoto.—Kiyoto porcelain. 213
- 17 Sinkiyomidzu, Z., Kiyoto.—Kiyoto
porcelain. 213
- 18 Susuki, Y., Yokohama.—Yokohama
faience. 213
- 19 Taizan, Y., Kiyoto.—Kiyoto faience. 213
- 20 Takahashi, D., Kiyoto.—Kiyoto porcelain. 213
- 21 Tanzan, S., Kiyoto.—Kiyoto porcelain
and faience. 213
- 22 Waki, K., Kiyoto.—Kiyoto porcelain. 213

Furniture and Objects of General Use in Construction and in Dwellings.

- 23 Ota, M., Tokio.—Cabinet-work. 217
- 24 Shiokawa, B., Kiyoto.—Picture
frames. 220
- 25 Susuki, M., Kiyoto.—Picture
frames. 220
- 26 Murakami, T., Kiyoto.—Tinware. 224

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 27 Fujikawa, I., Kiyoto.—Corrugated
cotton cloth. 230
- 28 Teramura, S., Kiyoto.—Cotton table
cloths. 231

Woven and Felted Goods of Wool and mixtures of Wool.

- 29 The Association of Women, Kiyoto.
—Cotton Dantsuori rugs. 239

Silk and Silk Fabrics, and Mixtures in which Silk is the predominating material.

- 30 Nomura, K., Kiyoto.—Raw silk. 242
- 31 The Yosamba Silk Association, Kiyoto.
—Raw silk. 242
- 32 Kangiorio (The Imperial Bureau of
Agriculture, Commerce, and Industry).—
Raw silk. 242
- 33 Inagaki, T., Chirikawa, R., Tomita,
T., Nobashi, S., & Co., Kiyoto.—
Crape. 245
- 34 Tomita, S., Kiyoto.—White or dark
barege. 245
- 35 Tsubaki, Y., Sendai.—White corded
silk. 245
- 36 Nakagawa, Y., Tachimoto, I., Kiyoto.
—Corrugated silk cloth. 245
- 37 Morita, B., Kiyoto.—Corrugated silk
cloth. 245
- 38 The Association of Women, Kiyoto.
—Pictures en relief on silk. 246
- 39 Kitaoka, H., Kiyoto.—Pictures en
relief on silk. 246
- 40 Katayama, G., Kiyoto.—Silk brocade
and fancy work. 246

Manufactures, Education, Art, Agriculture.

41 Kanada, S., Yashiro, M., Kitagawa, F., Araki, B., Hano, K., Takuma, S., Yamada, S., Yoshikawa, K., & Co., Kiyoto.—Collection of figured nishijin silks. 246

42 Hosoda, I., Kiyoto.—Embroidered crape wrappers, etc. 247

43 Ishida, R., Kiyoto.—Yujen crape, dyed and embroidered. 247

44 Kimoura, G., Kiyoto.—Yujen crape, dyed and embroidered. 247

45 Nakaye, S., Katta, G., & Co., Kiyoto.—Crape neckcloths and sashes. 247

46 Nishimura, G., Kiyoto.—Yujen crape, dyed and embroidered. 247

47 Sakakuchi, Mrs. M., Kiyoto.—Embroidered and dyed crape wrappers. 247

48 Idzukur, K., Kiyoto.—Silk braid. 249

49 Nakatsuji, T., Kiyoto.—Flat silk thread, used for embroidery. 249

50 Nose, G., Kiyoto.—Gold and silver silk thread for embroidery. 249

51 Osheki, I., Kiyoto.—Silk braid. 249

Clothing, Jewelry, and Ornaments, Traveling Equipments.

52 Nishimura, S., Kiyoto.—Silk embroideries. 252

53 Shibata, B., Kiyoto.—Silk embroidery. 252

54 Fukuda, K., Kiyoto.—Artificial flowers and ornamental hair pins, etc. 254

55 Ide, G., Kiyoto.—Dolls. 254

56 Katayama, G., Kiyoto.—Paper fancy work. 254

57 Kimoura, T., Sumii, Z., and Yamada, G., Kiyoto.—Round fans. 254

58 Noriami, F., Sokoami, S., Hayashiami, H., Mochiami, S., & Co., Kiyoto.—Fans. 254

59 Sakai, T., Kiyoto.—Fans. 254

60 Shichijo, Y., Kiyoto.—Dolls. 254

Paper, Blank Books, and Stationery.

61 Yoshida, K., Kiyoto.—Colored papers. 264

Medicine, Surgery, Prothesis.

62 Iwata, H., Kiyoto.—Glass eyes. 276

63 Sasaki, G., Nara, Y., & Co.—Surgical implements. 276

Fabrics of Vegetable, Animal, or Mineral Materials.

64 Funaki, S., Kiyoto.—Brush manufactures, etc. 286

65 Nabika, S., Kiyoto.—Brushes and articles made of hair, etc. 286

66 Shimidzu, F., Tokio.—Small wares made of bamboo. 289

Educational Systems, Methods, and Libraries.

67 Tamai, T., Muira, G., Iinuma, B., Mino.—Books and manuscripts. 306

Sculpture.

68 Imai, R., Kiyoto.—Ivory work. 405

Photography.

69 Sakai, T., Kiyoto.—Photographs. 430

Industrial and Architectural Designs, Models, and Decorations.

70 Obanawa, M., Shimanchi, G., Idzumi, O., Watanabe, Y., & Co., Tokio.—Stenciled designs for fans. 440

71 Marunaka, M., Kanazawa, Province of Kaga.—Takaoka and Kanazawa bronzes. 443

72 Shinoyama, T., Kiyoto.—Bronzes. 443

73 Kumagai, K., Kiyoto.—Bronzes. 443

74 Kawahara, R., Kiyoto.—Bronzes. 443

75 Yomo, Y., Kiyoto.—Bronzes. 443

76 Shinoyama, T. K., Kiyoto.—Bronzes. 443

77 Kawamoura, Y., Kiyoto.—Bronzes. 443

78 Hada, D., Kiyoto.—Bronzes. 443

79 Shomi, I., Kiyoto.—Bronzes. 443

80 Yoshida, Y., Kiyoto.—Bronzes. 443

81 Kanaya, G., Nakagawa, G., & Co., Kiyoto.—Bronzes. 443

Decorations with Ceramic and Vitreous Materials; Mosaic and Inlaid Work.

82 Marunaka, M., Kanazawa, Province of Kaga.—Wajima lacquer. 454

83 Okatani, S., Shibata, K., & Co., Nagoya, Province of Owari.—Cloisonne enamel on Owari faience. 454

84 Mita, C., Tokio.—Bronzes and Tokio lacquer. 454

85 Namikawa, S., Kiyoto.—Cloisonne enamel on bronze. 454

86 Arai, H., Tokio.—Tokio lacquer. 454

87 Kubota, K., Matano, H., Fukui, M., Hadano, K., Inagaki, M., Kitagawa, S., Matano, K., Tanaka, S., Nakashima, K., Chiba, K., Tanaka, Mrs., Nishimura, H., Kitaoka, Mrs., Kimura, F., Asano, F., & Co., Kiyoto.—Kiyoto lacquer. 454

Agriculture and Forest Products.

88 Matsuo, E., Tokio.—Seasoned bamboo. 600

Agricultural Products.

89 Kangiorio (The Imperial Bureau of Agriculture, Commerce, and Industry).—Collection of tea. 623

90 Okubo, K., and Takenouchi, R., Kiyoto.—Tobacco. 623

Marine Animals, Fish Culture and Apparatus.

91 Kojima, S., Kiyoto.—Silk fishing tackle and cord. 647

Animal and Vegetable Products.

92 Nagura, O., Tamba.—Edible seaweed. 650

93 Komoura, K., Kaga.—Japanese buildings. (In Park.)

Manufactures, Education and Science, Industrial Art.

94 Matsuo, K., Wakai, K., & Co., Tokio Trading Co., Tokio.—(*Collective exhibit.*) Tokio porcelain and faience; bronzes and silversmiths' work; Tokio lacquer; bamboo and wooden boxes, artificial flowers, etc.; small ware and toys; silks and embroideries; dyed leather; Himeji leather; paper hangings and imitations of leather, oil-cloth, etc.; writing materials; photographs of scenery; fans.

Special Exhibit purchased from the manufacturers by the Imperial Japanese Government.

Chemical Manufactures.

95 Ishizaka, S., Tokio.—Coal oil for lighting purposes. 201

Ceramics—Pottery, Porcelain, etc.

96 Mori, G., Kabe, S., & Co., Province of Ishe.—Banko faience. 213

97 Iida, G., Seto, Province of Owari.—Seto porcelain. 213

98 Gashiu, S., Awaji.—Awaji faience. 213

Furniture and Objects of General Use in Construction and in Dwellings.

99 Negishi, N., Tokio.—Carved wooden bedsteads. 217

100 Sumiyoshu, K., Tokio.—Various kinds of lacquered chairs. 217

101 Aoki, G. T., Province of Owari.—Geefoo lanterns. 223

Yarns and Woven Goods of Vegetable or Mineral Materials.

102 Yamada, D., Tajima Province.—Straw plait work. 229

103 Ono, G., Osaka, Province of Shetsu.—Cotton sails. 230

104 Yoniyama, T., Ichigo.—Corrugated cotton cloth. 230

105 Sakai Steam-power Manufactory, owned by the Imperial Ministry of Commerce and Industry.—Cotton cloth. 230

106 Kawashima, G., Tokio.—Dyed cotton thread. 230

107 Nokii, T., Province of Idzumi.—Cotton dantsuori rugs. 231

Silk and Silk Fabrics, and Mixtures in which Silk is the predominating material.

108 Yamagoto, Shinano.—Sochiu silk. 245

109 Ito, T., Sendai, Province of Iwagi.—Yatsubashi silk. 245

110 Watanabe, S., Kamesuki, Province of Iwagi.—Kamesuhi silk. 245

111 Susuki, Y., Province of Kai.—Various colored striped dress silks. 246

112 Nara, G., Province of Ugo.—Fancy white dress silk. 246

113 Yoshioka, S., Tango.—Crape. 247

114 Nishikori, K., Province of Omi.—Crape. 247

Clothing, Jewelry, and Ornaments, Traveling Equipments.

115 Iwari, G., Nara, Province of Yamato.—Fine wares and fancy work. 254

116 Masaki, C., Tokio.—Artificial fruits. 254

Paper, Blank Books, and Stationery.

117 Tanaha, K., Echizen.—Various writing papers. 259

118 Tsuboya, Province of Ishe.—Tsuboya paper. 260

119 Goto, T., Province of Mino.—Mino paper. 260

Fabrics of Vegetable, Animal, or Mineral Materials.

120 Kodama, H., Arima, Province of Setsu.—Bamboo work. 289

121 Miasake, R., Shinano.—Bamboo work. 289

122 Nishimura, T., Minakuchi, Province of Omi.—Wood work of the Fuji tree (*Wisteria chinensis*). 289

123 Yamamoto, Y., Shidzuoka, Province of Suruga.—Bamboo work. 289

Educational Systems, Methods, and Libraries.

124 Fukui, B., Tokio.—Model of a lecture room at Tokio. 302

Scientific and Philosophical Instruments and Methods.

125 Nagata, G., Tokio.—Philosophical instruments. 320

126 Masuda, G., Tokio.—Scales (European method). 322

127 Shisui, H., Tokio.—Scales (Japanese method). 322

128 Nagayama, S., Tokio.—National weights and measures. 322

129 Taru, S., Tokio.—Bushel measures. 322

Industrial and Architectural Designs, Models, and Decorations.

130 Takusai, S., Sado.—Bronzes. 443

Decorations with Ceramic and Vitreous materials; Mosaic and Inlaid Work.

131 Nishimura, S., Province of Hoki.—Inlaid wood work. 452

132 Yamamoto, Y., Shidzuoka, Province of Suruga.—Inlaid wood work. 452

133 Yamamoto, H., Shizuoka, Province of Suruga.—Lacquer ornamented with the bluish-colored shell of the "Sea ear" *Haliotis Tuberculata*. 452

Industrial Art, Agricultural Products.

- 134 Fukihara, S., Tokio. — Cloisonne enamel on bronze and faience. 454
- 135 Makemura, S., Wahasa. — Wahasa lacquer. 454
- 136 Aomi, G., Tswhima, G., & Co., Tsugaru, Province of Mutsu. — Tsugaru lacquer. 454
- 137 Fujisawa, H., Osaka, Province of Setsu. — Tsuekoku lacquer. 454
- 138 Ishioka, S., Nojiro, Province of Ugo. — Nojiro lacquer. 454
- 139 Iwashi, K., Kuroe, Province of Kishiu. — Kuroe lacquer. 454

Animal and Vegetable Products.

- 140 Sawada, G., Province of Bingo. — Sake, the Japanese national drink, similar to Arak, and distilled from rice. 660
- 141 Kitakase, Mrs., Hiogo. — Vinegar distilled from rice. 660

Textile Substances, of Vegetable or Animal origin.

- 142 Steam Manufactory at Tomioka, near Tokio, owned by the Imperial Ministry of Commerce and Industry. — Cocoons and raw silk. 668

HAWAII.—STATISTICAL PREFACE.

THE islands forming the kingdom of Hawaii are eight in number, exclusive of one or two small islets. The chain runs from southeast to northwest, and lies in the middle of the Pacific Ocean, in latitude 19° — 22° north, and longitude 155° — 160° west. Area 7400 square miles; population (1872), 56,897, of whom 2539 were Europeans. The names, with the areas, of the respective islands are: Hawaii (formerly Oghyhce), 4850 square miles; Maui, 750; Oahu, 700; Navi, 780; Molokai, 170; Lanai, 170; Nuhauf about 110; and Kahoolau, about 40 square miles.

Situated near the middle of the Pacific Ocean, about half the distance from San Francisco in North America that they are from Melbourne in Australia and Canton in China, the Sandwich Islands form an oasis in the middle of a wide ocean waste, and offer convenient stations for the refreshment and repair of the merchantmen and whalers that traverse the Pacific. They are of volcanic origin, and contain the largest volcanoes, both active and quiescent, in the world. The most prominent physical features of the group are the two lofty mountain peaks of Hawaii, Mauna Kea and Mauna Loa, each of which is 14,000 feet in height, or within 1860 feet of the loftiest of the Alps. Besides those two chief peaks, which stand apart from each other, and one of which is covered with perpetual snow, the island is traversed by other mountains, which give it a rugged and picturesque outline, and in some cases front the sea in bold, perpendicular precipices, from 1000 to 3000 feet in height. In general, the islands are lofty—the small islet of Lehua is 1090 feet high, and the upland regions of Kauai are, on an average, 4000 feet above sea level. Within the coral reefs, which, in single, and more rarely in double ridges, skirt portions of the coasts, sandy shores, leading up to rich pasture-lands, and occasionally to productive valleys, are frequently seen. Everywhere, however, the configuration of the surface betrays the volcanic origin of the islands. Extinct and partially active volcanoes occur in most of the islands. Kilauea, on the Mauna Loa mountain in Hawaii, the largest active volcano in the world, has an oval-shaped crater nine miles in circumference, and is 6000 feet above sea level. In the centre of this immense caldron is a red sea of lava, always in a state of fusion. At intervals, the lava is thrown to a great height, and rolls in rivers down the mountain sides. On Maui, the crater of Mauna Haleakala (House of the Sun), by far the largest known, is from 25 to 30 miles in circumference, from 2000 to 3000 feet deep, and stands 10,000 feet above sea level. Within this huge pit, about 16 basins of old volcanoes, whose ridges formed concentric circles, have been counted. Good harbors are few. The chief is that of Honolulu, in Oahu, with $22\frac{1}{2}$ feet of water in its shallowest parts. On the same island is Ewa, an immense basin, with 12 feet of water at low tides. During the

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15.	Rheumatism, Pain in Back, Side, or Limbs	25 " 50
16.	Fever and Ague, Intermittent Fever	50
17.	Piles, Internal or External, Blind or Bleeding	50
18.	Ophthalmia, Weak or Inflamed Eyes	50
19.	Catarrh, Acute or Chronic, Dry or Flowing	50
20.	Whooping-Cough, Spasmodic Cough	50
21.	Asthma, Oppressed, Difficult Breathing	50
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23.	Scrofula, Swellings and Ulcers	50
24.	General Debility, or Physical Weakness	50
25.	Dropsy, Fluid Accumulations	50
26.	Sea-Sickness, Nausea, Vomiting	50
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33.	Epilepsy and Spasms, St. Vitus' Dance	1 00
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THE ORIGIN OF CO-OPERATIVE NEWSPAPER ADVERTISING.

Co-operative newspaper printing, as now practised, originated in Wisconsin twelve years ago. It is termed *co-operative* for the reason that one side of each of the newspapers is printed at a central office, and the paper sent in its half-printed state to the home office, where it is completed with editorials, local news, and other matter prepared by the editor or publisher. In December, 1846, the idea of co-operation, *with advertisements*, occurred to Mr. Aikens, while yet serving his time as an apprentice, in printing the message of President Polk on one side of a country newspaper of New England at Boston, and the other half being printed at the local office.

Mr. A. J. Aikens, a practical printer and business man, conceived the idea of reducing the cost of ready-printed paper, as it is now termed, to country publishers, by making an agreement with them to use a certain space in each of their papers for advertisements that he might procure. This plan of co-operation he put into practice twelve years ago, at the office of Cramer, Aikens & Cramer, Milwaukee. It at once became successful, leading to the establishment of co-operative newspaper printing-offices in Chicago, New York, St. Louis, Cincinnati, Memphis, St. Paul, and other places. There are now over two thousand newspapers printed upon the co-operative plan in the United States and Canadas, and the number is constantly increasing, it having more than doubled in the last five years. The enterprise is no longer an experiment, but an established success, and the system is one yielding manifold advantages to advertisers as well as to local publishers.

The American Newspaper Union

Is essentially national. The papers represented in it are located in all the States of the Union and in nearly five hundred county seats. They circulate over the whole area of the country from Maine to Colorado, distributing at least *one hundred copies every year to each square mile of the settled portions of the United States*.

Although, as a whole, the Union List is national, covering all sections, it is so made up of different members as to be susceptible of easy division into sections—East, Middle, West, South. The distribution of the papers is as follows :

New England	78	Illinois	117	Nebraska	15
New York	101	Michigan	86	Missouri	17
New Jersey	27	Wisconsin	98	Georgia	10
Pennsylvania	65	Tennessee	29	Alabama	32
Virginia	24	Kentucky	29	Louisiana	11
No. and So. Carolina . .	24	Minnesota	79	Mississippi	29
Ohio	122	Iowa	85	Other States	46
Indiana	81				

AGGREGATE CIRCULATION.

The circulation of these papers is large and constantly increasing. It is larger than the circulation of any other lists or combinations of country papers in the United States—the last aggregate weekly circulation being *seven hundred thousand seven hundred and thirty copies* (700,730).

SEND TO EITHER OFFICE FOR A CIRCULAR.

prevalence of the trade wind, which blows southwest for about nine months of the year, the south shores of the islands afford safe anchorage almost everywhere.

At Honolulu, the extremes of temperature in the shade during the 12 months are 90° and 50°, and the diurnal range is 12°. Rains brought by the northeast trade-wind are frequent on the mountains; but on the leeward side of the islands little rain falls, and the sun is rarely obscured by the clouds. The soil, the constituent parts of which are mainly scoræ, decomposed lava, and sand, is generally thin and poor. This, however, is not universally the case. At the bases of the mountains and in the valleys, where abrasion, disintegration, and the accumulation of vegetable mould have gone on for ages, there are extensive tracts as fertile as they are beautiful. The islands produce fine pasturage in abundance, and large herds are bred and fattened to supply meat to the whalers and merchant ships. The upland slopes of the mountains are clothed with dense forests; and lower down are grassy plains and sugar and coffee plantations. Basalt, compact lava, coral rock, and sandstone are used for building purposes. No metals occur. Several of the islands, especially Hawaii and Kauai, are well supplied with rivers, which, from the size and conformation of the group, are necessarily small, but afford great facilities for irrigation. Vast numbers of semi-wild horses roam the islands, and while they consume the pasturage and break down the fences, are of little use. The indigenous fauna is small, and consists mainly of swine, dogs, rats, a bat that flies by day, birds of beautiful plumage, but for the most part songless. Among the indigenous trees and plants are the sugar-cane, banana, plantain, cocoanut, candle-nut, various palms, the taro, a succulent root which formed the staple of the food of the natives, and is still generally used, the cloth-plant, and the *ti*, the roots of which were baked and eaten, while the leaves were used for thatching huts. Cattle and other useful and foreign animals and plants were introduced by Vancouver and other navigators. In 1860 there were 30,000 mules and semi-wild horses in the kingdom.

The government of Hawaii is a constitutional monarchy.

The public revenue during the year ending March 31st, 1874, was 1,136,524 dollars; the public expenditure, 1,192,512 dollars. The public debt, at the same date, 355,050 dollars.

The principal exports during the year 1874 were: Sugar, 24,567,000 pounds; rice, 1,188,000 pounds; coffee, 75,000 pounds; pulu, 418,000 pounds; tallow, 126,000 pounds; wool, 400,000 pounds; hides, 94,575. Total value, 1,839,000 dollars. The imports during the same year amounted in value to 1,310,000 dollars.

Of 115 vessels that entered the port of Honolulu during 1874, 64 were American, 30 English, 15 Hawaiian, etc.

Commission from THE HAWAIIAN ISLANDS to the International Exhibition.

HON. S. G. WILDER, Minister of the Interior.

HON. J. U. KAWAIMUI.

ELISHA H. ALLEN, JR.

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HAWAII.

(*South of South Avenue, Columns 10 to 14.*)

Manufactures, Education and Science, Art.

Minerals, Ores, Stone, Mining Products.

- 1 Gilman, J. H.—Lava specimens from Kilaurea. 100
- 2 Hawaiian Museum.—Geological specimens, by W. L. Green. 100
- 3 Hitchcock, H. R.—Geological specimens from crater of Kilaurea. 100
- 4 Boys' Boarding School.—Coal from the forests of Haleakala. 101

Chemical Manufactures.

- 5 Pinkham, G. S.—Blacking. 202

Furniture and Objects of General Use in Construction and in Dwellings.

- 6 Auld, William.—Cue. 217
- 7 Brown, G. W.—Table from a variety of woods. 217
- 8 Kamaipelekane, E. P.—Fac-simile of bed, etc., used by Kamehamha I. 217
- 9 Fischer & Co.
a Small and large tables, revolving book rack. 217
b Picture frame. 220
- 10 Williams, C. E.—Revolving shell case. 217
- 11 Hopper, J. A.—Kou calabashes. 224

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 12 Gilman, J. H.—Bamboo of silky fibre for decorations. 229

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 13 Dickson, J. Bates.—Micronesian curiosities and corals. 253
- 14 Whitney, H. M.—Micronesian corals. 253
- 15 Beckley, F. W.—Set of kapa. 254
- 16 Boyd, Miss E.—Spatter work of mottoes and island ferns. 254
- 17 Kealoha.—Set of kapa. 254
- 18 Oahu College.—Land shells. 254
- 19 Rose, Katie.—Set of kapa. 254
- 20 Williams, C. E.—Canes. 254
- 21 Wilder, Helen.—Manahiki woman's hair. 254

- 22 Young, Mrs.—Wreath of mosses and shells. 254

Fabrics of Vegetable, Animal, or Mineral Materials.

- 23 Department of War.—Hawaiian flag, royal standard. 288

Carriages, Vehicles, and Accessories.

- 24 Lyman, F. S.—Saddle and bridle. 296

Educational Systems, Methods, and Libraries.

- 25 Department of Education.
a Photographs of school houses and groups of Hawaiian teachers and pupils. 300
b Hawaiian school books and legislative reports. 306
- 26 Department of Government Survey.—Map of the Hawaiian islands. 300
- 27 Damon, S. C.—"The Friend" and Bowditch's Navigator in Japanese. 306
- 28 Whitney, H. M.—"Gazette" and "Kuokoa" for 1875. 306
- 29 Sheldon, H. L.—"Pacific Commercial Advertiser." 306

Institutions and Organizations.

- 30 Clarke, F. L.—Hawaiian curiosities; cocoanut shell water calabash, lei palava tobacco pipe, stone lamp, stone adze, sling stone. 312

Engineering, Architecture, Charts, Maps, and Graphic Representations.

- 31 Honolulu Iron Works.—Drafts of machinery. 330
- 32 Alexander, W. D.—Map of the crater of Haleakala. 335

Physical, Social, and Moral Condition of Man

- 33 Native of Hawaii.—Kapa idols. 348

Painting.

- 34 Spencer, O. B.—Oil painting "Hilo Bay" by J. H. Nawaki. 410
- 35 Bailey, E.—Oil paintings. 410
a Bird's eye view of the crater of Haleakala.
b View of Hilo Village and Cocoanut Island.
c Views in Hilo.
d Scenery in Iao Valley.

Art, Agriculture.

Photography.

- 36 Honolulu Iron Works.—Photographs of works. 430
 37 Thrum, T. G.—Photograph of Honolulu. 430
 38 Dickson, M.—Photographs of Island scenes. 430

Ceramic Decorations, Mosaics, etc.

- 39 Department of Interior.—Hawaiian coat of arms painted on glass. 453

Arboriculture and Forest Products.

- 40 Boys' Boarding School.
a Woods from the forests of Haleakala. 600
b Silver swords, living ferns. 604
 41 Andrews, C. B.—Mounted ferns. 604
 42 Hitchcock, D. H. & E. G.—Specimens of the pulu ferns, silver swords. 604
 43 Hitchcock, H. R.—Ferns and mosses. 604

- 44 Jones, G. W. C.—Bale of pulu and fern. 604

Agricultural Products.

- 45 Hackfeld, H., & Co.—Coffee from H. N. Greenwell. 623

Land Animals.

- 46 Mills, J. D.—Hawaiian birds. 635

Animal and Vegetable Products.

- 47 Krull, E.—Tallow. 652
 48 Lyman, F. S.—Leather. 652
 49 Eldarts, T. E.—Arrowroot and tapioca. 658
 50 McLean, G. C.—Castor, cocoanut, and kukui oils. 662

Textile Substances of Vegetable or Animal Origin.

- 51 Holstein, H.—Sea Island cotton. 665

BRAZIL.

(North of Nave, Columns 58 to 61.)

Chemical Manufactures, Ceramics.

Chemical Manufactures.

- 1 Lendenberg, B.—Sea-salt from Cape Frio. 200
 2 Maia, Ferreira, & Co.—Pharmaceutical preparations. 200
 3 Pharmaceutical Preparations Co., Rio de Janeiro.—Pharmaceutical and chemical preparations. 200
 4 Province of Maranhao.—Pharmaceutical preparations. 200
 5 Province of S. Paulo.—Medicines. 200
 6 Viotti, E.—Pharmaceutical preparations. 200
 7 Penna, Aranje.—Medicines. 200
 8 Lepage.—Pharmaceutical preparations. 200
 9 Duarte, Dias.
a Drugs. 200
b Oils. 201
 10 Alves, Pereira.—Soaps and candles. 201
 11 Province of Ceara.—Medicinal oils. 201
 12 Province of Para.—Medicinal oils. 201
 13 Alves Guimaraes.—Soap and candles. 201
 14 Henninger.—Soft and scented soaps. 201
 15 Stechel.—Oils. 201
 16 Oliveira & Bro.—Soap. 201
 17 Province of Parana.—Soap and candles. 201

- 18 Candido & Gonsalves.—Soaps. 201
 19 Lang, I.—Toilet soaps. 201
 20 Safarana.—Wax candles. 201
 21 Stearic Light Co.—Soap and stearine candles. 201
 22 Idem.—A table made of soap. 201
 23 Lang & Co.—Scented soap. 201
 24 Guimaraes, Silva.—Varnish. 202
 25 Leao & Alves.—Flavoring extracts and perfumery. 203
 26 N. N.—Flavoring extracts, essences, and perfumery. 203
 27 Frey, Otto.—Essences. 203
 28 Le Page.—Essences. 203
 39 Carvalho & Bro.—Soap and candles. 203
 30 Monteiro & Co.—Writing inks. 203
 31 Province of S. Paulo.—Writing inks. 203
 32 Silva, Samuel G. da.—Copying and writing inks. 203
 33 Lillela.—Writing ink. 203

(Fuses and pyrotechnics are exhibited in Machinery Hall.)

Ceramics—Pottery, Porcelain, Glass, etc.

- 35 Grillo.—Ceramics. 206
 36 Province of Rio-Grande-do-Sul.—Stone bricks. 206
 37 Esberard.—Ceramics. 206
 38 Commissioner-General for the Province of Parana.—Tiles and bricks. 206

Furniture, Woven Goods, Clothing, Fancy Goods.

- 39 Colony of D. Francisca.—Bricks and tiles. 206
 40 Patury, Junior.—Earthen bottles and glassware. 210
 41 Almeida, J. J.—Glassware. 216

Furniture and Objects of General Use in Construction and in Dwellings.

- 42 Commissioner of the Province of Parana.—Shelves, straw-bottomed benches, and lady's work-box. 217
 43 Happel & Bro.—Parlor suit. 217
 44 Province of S. Paulo.—Furniture made of straw. 217
 45 Bierremback & Bro.—Iron chair. 217
 46 Penitentiary-House, Rio de Janeiro.—Writing-desk, arm-chair, album, and furniture. 217
 47 Commissioner-General for Brazil.—Straw-seated rosewood parlor suit and piano stool. 217
 48 Colony of D. Francisca.—Reed parlor and chamber suits. 217
 49 Borddal, Jonas.—Tables, ladies' work-boxes, and shelves. 217
 50 Itabapoana, Baron de.—Reclining chair. 217
 51 Province of Maranhao.—Chair. 217
 52 Province of Sancta Catharina.—Furniture. 217
 53 Kerne, Clara, & Lang, Pécla.—Arm-chairs. 217
 54 Keppler & Irmao.
 a Chairs. 217
 b Frames, wooden box imitating mosaic. 220
 55 Province of Sancta Catharina.—Wood for furniture. 217
 56 Guerth, John.—Reeds for furniture. 217
 57 Silva, Xavier da.—Articles of various woods. 217
 58 Arsenal of Rio de Janeiro.—Models of iron and steel fire-proof safes for the staff's service in campaign. 217
 59 Rocha, Polybio da.—Multiform piece of furniture of wood. 217
 60 Colony of D. Francisca.—Various articles. 220
 61 Province of Parana.—Various articles. 220
 62 Marques, Junior.—Bath-tub and shower-bath. 226

Yarns and Woven Goods of Vegetable or Mineral Materials.

- 63 Province of Amazonas.
 a Netting for hammocks and beds. 228
 b Brooms and cordage of rattan. 229
 64 Province of Para.—Netting for hammocks and beds. 228
 65 Province of Ceara.—Netting for hammocks and beds. 228
 66 Silva, Rebello da.—Cotton fabrics. 230
 67 Province of Minas-Geraes.—Cotton fabrics. 230
 68 Arouca & Camp.—Cotton fabrics. 230
 69 Colony of Blumenau.—Cotton fabrics. 230

- 70 Province of Parana.—Twisted yarns. 230
 71 Brazil Industrial Company.—Cotton fabrics. 230
 72 Reyner, Fernandes.—Dyed fabrics. 231

Woven and Felted Goods of Wool and Mixtures of Wool.

- 73 Rhenigrantz & Walter.—Woolen shawls and blankets. 237

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 74 Doel, Adolpho.—Underclothing. 250
 75 Command of the Police Corps, Rio de Janeiro.—Uniform and equipment of the corps. 250
 76 Arsenal of Rio de Janeiro.—Copies of the uniforms worn by the Brazilian army. 250
 77 Requiae, Pinheiro.—Hats. 251
 78 Province of Rio de Janeiro.
 a Hats. 251
 b Walking canes. 254
 79 Chastel & Co.—Hats. 251
 80 Cathiard.—Boots and shoes. 251
 81 Figuerdo & Co.—Boots and shoes used by the Brazilian army and navy. 251
 82 Viguiet, H.—Boots and shoes. 251
 83 Province of Alagoas.—Shoes. 251
 84 Province of Rio Grande do Norte.—Shoes. 251
 85 Bierremback.—Felted and silk hats. 251
 86 Province of Maranhao.—Hats. 251
 87 Fischer, F.—Silk hats. 251
 88 Almada, A. d'.—Hats, caps, and bonnets. 251
 89 Province of Amazonas.—Straw hats. 251
 90 Imperial Fluminense Agricultural Institute.
 a Felt hats. 251
 b Cigar cases. 254
 91 Valentim, M. T.—Jewelry. 253
 92 Natte.
 a Jewelry made of scarabees and other insects. 253
 b Feather flowers and fans, and various feather adornments. 254
 93 Province of Rio Grande do Norte.—small tortoise-shell boxes. 254
 94 Ferreira, jr.—Walking canes and sticks. 254
 95 Province of Maranhao.—Vases in the form of shells. 254
 96 Guimaraes, M. A.—Flower-stand containing artificial flowers. 254
 97 Province of Sancta Catharina.—Artificial flowers. 254
 98 Penitentiary House, Rio de Janeiro.—Articles of tanned leather. 255
 Paper, Blank Books, and Stationery.
 99 Province of Sancta Catharina.—Inkstands and blank books. 258

Surgical Appliances, Cordage, Saddlery, Leather.

Medicine, Surgery, Prothesis.

- 100 Merino.—Surgical instruments. 276
 101 Faria, J. Bento, de.—Artificial teeth and sets of teeth. - 277
 102 Costa, Silva.—Artificial teeth and sets of teeth. 277
 103 Diniz, J. Borges.—Artificial teeth and sets of teeth. 277

Fabrics of Vegetable, Animal, or Mineral Materials.

- 104 Province of Goyaz.
 a Brooms. 286
 b Ropes. 287
 105 Netto, Silva.—Cordage. 287
 106 Dias, Falcao.—Cordage and ropes. 287
 107 Naval Arsenal, Rio de Janeiro.—Cordage, cords, lines, and strings for ships. 287
 108 Province of Rio de Janeiro.—Baskets of reed. 289

Carriages, Vehicles, and Accessories.

- 109 Arsenal of Rio de Janeiro.—Military equipments, pair of saddle-bags used by officers in campaign, equipment for infantry and artillery, equipment and harness for cavalry and mounted artillery, harness of pig-skin for officers' horses. 296
 110 Caky, Baron do.—Complete set of harness. 296
 111 Guimaraes, Abren.—Saddles and side saddles. 296
 112 Guimaraes, Farquinio.—Saddles and side saddles. 296
 113 Province of S. Paulo.—Sole-leather harness. 296
 114 Province of Sancta Catharina.—Leather saddles and harness; serigote or complementar, a piece of the harness used especially at the province of Rio Grande do Sul. 296
 115 Wirmand, F.—Collection of insects. 638
 116 Resende, Luiz.—Collection of insects. 638
 117 Supplici.—Collection of insects. 638
 118 Filko, Feydit.—Tanned hides. 652
 119 Province of Rio Grande do Sul.—Patent leathers. 652

ARGENTINE REPUBLIC.

(South of Nave, Columns 2 to 5.)

Chemical Manufactures.

Chemical Manufactures.

- 1 Serravalle, Carlos, Province of Corrientes.—Chemical and pharmaceutical preparations. 200
 2 Queirel, Joaquin, Province of Corrientes.—Depurative solution. 200
 3 Fáva, Carlos, Province of Corrientes.—Bitters, digestive pepsin wine, pectoral syrup. 200
 4 Sub-Commission of Bella Vista, Province of Corrientes.—Salt extracted from clay; sample of clay. 200
 5 Perez, A. G., Province of La Rioja.—Tonic. 200
 6 Gelos, Martin, Province of La Rioja.—Sea salt. 200
 7 Provincial Commission, Province of La Rioja.—Salt and alum. 200
 8 Provincial Commission, Province of Santiago del Estero.—Ashes for soap manufacturing. 200
 9 Provincial Commission, Province of Salta.—Potash for soap manufacturing. 200
 10 Justice of the Peace of Bahia Blanca, Province of Buenos Ayres.—Salt. 200

- 11 Justice of the Peace of Patagones, Province of Buenos Ayres.—Salt. 200
 12 Murga, N., Patagones, Province of Buenos Ayres.—Coarse salt. 200
 13 Provincial Commission, Province of Tucuman.—Sea salt. 200
 14 Commission of Andalgalá, Province of Catamarca.—Rock salt from Laguna Blanca. 200
 15 Provincial Commission, Province of Catamarca.—Rock salt from Fiambalá. 200
 16 Queveda, Samuel A., Lafone, Province of Catamarca.—Ashes of Cachi-Yuyo for the production of carbonate of soda; carbonate of soda. 200
 17 Provincial Commission, Province of Jujui.—Loaf of salt. 200
 18 Escobar, Juan de D., Province of San Luis.—Salt. 200
 19 Terramola, Delfin, Province of San Juan.—Salt from the mines of Leoncito. 200
 20 Jones, Fabian, Province of San Juan.—Ashes for manufacturing soap. 200
 21 Vidal, M. A., Province of San Juan.—Ashes for manufacturing soap. 200
 22 Bruna, Estevan, Province of San Juan.—Ashes for manufacturing soap. 200

Chemical Manufactures, Ceramics, Furniture, Woven Goods.

- 23 Escrich, Pedro, Province of Buenos Ayres.—Peanut oil. 201
- 24 Oliden, Tomas, Province of Buenos Ayres.—Oil of caracú. 201
- 25 Cardalda, Inocencio, Province of Buenos Ayres.—Glycerine. 201
- 26 Piñero, Aurello, Province of Buenos Ayres.—Soap. 201
- 27 Lanieri, Miguel, Province of Entre-Rios.—Soap. 201
- 28 Iglesias, José, Province of Entre-Rios.—Soap. 201
- 29 Quevedo, Samuel A., Province of Catamarca.—Soap. 201
- 30 Provincial Commission, Province of Catamarca.—Soap. 201
- 31 Provincial Commission, Province of Salta.—Soap. 201
- 32 Provincial Commission, Province of Córdoba.—Balsamic oil. 201
- 33 De Dávila, Carmen T., Province of La Rioja.—Olive oil. 201
- 34 Alric, Antonio, Province of San Luis.—Soap. 201
- 35 Billar, Salvador, Province of Jujui.—Petroleum. 201
- 36 Julien, J. (Son), Province of Buenos Ayres.—Dyed stuff fabrics. 202
- 37 Prat, Adrian, Province of Buenos Ayres.—Dyed wool. 202
- 38 Doucet, Emilio, Province of Buenos Ayres.—Writing fluids. 202
- 39 Mujica, S. Eleuterio, Province of Buenos Ayres.—Soluble blood albumen for producing fast colors. 202
- 40 Herrera, Melchora, Province of Catamarca.—Seeds of penca, quimil, and sinta. 202
- 41 Laborda, Franklin, Province of San Luis.—Blue and red colored water. 202
- 42 Nolte, Ernesto, Province of Buenos Ayres.—Tooth powder. 203
- Ceramics—Pottery, Porcelain, Glass, etc.**
- 43 Pedruncini, Juan, Province of Buenos Ayres.—Burnt bricks. 206
- 44 Valdes, Emiliano, & Ciprinano, Province of Buenos Ayres.—Burnt brick from Balcarce; brick made of black clay. 206
- 45 Fauvety & De Ville Massot, Province of Buenos Ayres.—Bricks. 206
- 46 Sub-Commission of the Department of Victoria, Province of Entre-Rios.—Mouldings for buildings. 206
- 47 Fudicar & Co., H., Province of Entre-Rios.—Bricks made in Gualeguaychú. 206
- 48 Commission of the Department of Paraná, Province of Entre-Rios.—Tiles and bricks made in Victoria. 206
- 49 Provincial Commission, Province of Córdoba.—Tiles of burnt clay, of San Vincente Factory. 206
- 50 De Grunes & Co., Chaco, Argentine Territory.—Bricks. 206
- 51 Cervera & Co., Province of Santa Fé.—Tiles and bricks. 206
- 52 Provincial Commission, Province of Córdoba.—Flower pots, jars, stew pans, and dishes. 207
- 53 Echevarria, Cecillo, Province of Santa Fé.—Pitchers made by Indians. 207
- 54 Provincial Commission, Province of Salta.—Pans and plates. 207
- 55 Provincial Commission, Province of San Luis.—Crockery. 207
- 56 Alegre, Juan, Province of Corrientes.—Italian earthenware. 207
- 57 Provincial Commission, Province of Corrientes.—Crockery. 207
- 58 Provincial Commission, Province of Mendoza.—Fruit stands, flower pots, tumblers, etc. 216
- 59 Echevarria, Cecillo, Province of Santa Fé.—Glasses, goblets, flower pots, fruit dishes, salt cellars, covered dishes. 216
- Furniture, and Objects of General Use in Construction and in Dwellings.**
- 60 Provincial Commission, Province of Córdoba.—Tables of cocoanut and carob-tree wood. 217
- 61 Provincial Commission, Province of Salta.—Table with stone top. 217
- 62 Gimenez, Luis, Province of Buenos Ayres.—Combined writing desk, washstand, etc. 217
- 63 Galeano, Salvador, Province of Buenos Ayres.—Venetian blinds. 217
- 64 Molinari, Joaquin, Province of Buenos Ayres.—Carved arm chair. 217
- 65 Provincial Commission, Province of Catamarca.—Cups made of Retamo wood, silver drinking tubes. 218
- 66 Provincial Commission, Province of Córdoba.—Wooden cups, silver pitchers. 218
- 67 Ladies' Commission, Province of San Luis.—Plain and carved cups. 218
- 68 Provincial Commission, Province of Tucuman.—Cebil wood cups. 218
- 69 Güemes, Domingo, Province of Salta.—Cup of lignum vitæ. 218
- 70 Provincial Commission, Province of Salta.—Goblets and cup of lignum vitæ. 218
- 71 Azzimonte, Luis, Province of Buenos Ayres.—Silver drinking cup and tube. 218
- 72 Escobar, Juan de D., Province of San Luis.
 a Wooden dish and soup ladle. 224
 b Wooden washing tub. 225
- Yarns and Woven Goods of Vegetable or Mineral Materials.**
- 73 De Carreras, C. Rosaura, Province of Mendoza.—Matting made of wood fibre. 229
- 74 Provincial Commission, Province of Mendoza.—Mat made by prisoners in the penitentiary. 229
- 75 Benevolent Society, Province of Buenos Ayres.—Hemp mat. 229
- 76 Provincial Commission, Province of Corrientes.—Cotton counterpanes; spun cotton. 230
- 77 Sotomayor, Pretrona, Province of Corrientes.—Cotton counterpane. 230

Woven Goods, Silk.

- 78 Mantilla, Concepcion, Province of Corrientes.—Cotton counterpane; spun cotton fabrics. 230
- 79 Sub-Commission of Bella Vista, Province of Corrientes.—Cotton yarn. 230
- 80 De Llanos, Jorge R., Province of Salta.—Poncho, a national garment. 230
- 81 Provincial Commission, Province of Salta.—Embroidered towel. 230
- 82 Zorilla, Benjamin, Province of Salta.—Hammock; poncho, a national garment. 230
- 83 Provincial Commission, Province of La Rioja.—Cotton shawl, table cloth, and carpet. 230
- 84 Provincial Commission, Province of Catamarca.—Cotton napkins and table cloth. 230
- 85 Ponce, Delfina, Province of Catamarca.—Table cloth. 230
- 86 Government of the Province of Catamarca.—Cotton table cloth, napkins, handkerchief, and counterpane. 230
- 87 Echevarria, Cecillo, Province of Santa Fé.—White and colored cotton from the Province of Corrientes. 230
- 88 Silva, Florentino, Province of Corrientes.—Cotton from Gayasta. 230
- 89 Commission of the Province of Santiago del Estero.—Cotton counterpane. 230
- 90 Provincial Commission, Province of Tucuman.—Poncho, a national garment. 230
- 91 Commission of the Province of Córdoba.—White counterpanes. 230
- 92 Roibon, Federico, Province of Corrientes.—Fabric made by Indians from a native plant. 233
- 93 Benevolent Society of the Paraná, Province of Entre Rios.—Distaff with thread. 233
- 94 Carreras, Rosaura C. de, Province of Mendoza.—Carpet of peca thread. 233
- 95 Provincial Commission of the Province of Salta.—Wicker work cuirass; line made of chaguar. 233

Woven and Felted Goods of Wool, etc.

- 96 Provincial Commission, Province of Salta.—Woolen fabrics, saddle bags, cloth, etc. 235
- 97 Provincial Commission, Province of Jujui.—Woolen fabrics, ropes and slings, saddle bags. 235
- 98 Palacios, Prudencio, Province of Salta.—Woolen fabrics. 235
- 99 Diaz, Julia, Province of Catamarca.—Dyed woolen counterpane. 235
- 100 Quevedo, Samuel A. Lafone, Province of Catamarca.—Dyed skein of wool. 235
- 101 Carranza, E. Adolfo, Province of Catamarca.—Woolen counterpane. 235
- 102 Government of the Province of Catamarca.—Woolen articles. 235
- 103 Provincial Commission, Province of Tucuman.—Manufactures of wool. 235
- 104 Provincial Commission, Province of Corrientes.—Yarns and woolen goods. 235

- 105 Sub-Commission of Bella Vista, Province of Corrientes.—Dyed woolen yarns. 235
- 106 Commission of the Province of Córdoba.—Woolen yarns and fabrics. 235
- 107 Manufacturing Company of Rio de la Plata, Province of Buenos Ayres.—Cloth. 235
- 108 Provincial Commission, Province of Buenos Ayres.—Fabrics made by the Pampas Indians. 235
- 109 Provincial Commission, Province of Santiago del Estero.—Woolen counterpanes. 237
- 110 Provincial Commission, Province of San Luis.—Woolen mattress, saddle bags, quilt. 237
- 111 Provincial Commission, Province of La Rioja.—Quilt, boa, etc. 237
- 112 Provincial Commission, Province of San Juan.—Woolen cloaks. 237
- 113 Commission of the Province of Córdoba.—Tulumba blankets. 237
- 114 Bustamente, Abdon, Province of Córdoba.—Blanket. 237
- 115 Government of the Province of Catamarca.—Vicuña blankets. 237
- 116 Provincial Commission, Province of San Juan.—Blankets. 237
- 117 Provincial Commission, Province of San Luis.—Blanket. 237
- 118 Provincial Commission, Province of Jujui.—Blanket. 237
- 119 Provincial Commission, Province of Córdoba.—Carpets. 239
- 120 Carrera, Rosaura C., Province of Mendoza.—Ladies' head-dress, collars, bracelets, and gloves made of bristles. 240
- 121 Franco, Luis A., Province of Catamarca.—Vicuña cloak. 240
- 122 Quevedo, Lafone S. A., Province of Catamarca.—Vicuña cloak, without seam; handkerchief and garment. 240
- 123 Schikendantz, Maria, Province of Catamarca.—Vicuña quilt. 240
- 124 Government of the Province of Catamarca.—Vicuña scarf, cloak, handkerchief, and quilt. 240
- 125 Commission of the Province of Salta.—Vicuña cloak. 240
- 126 Provincial Commission, Province of Tucuman.—Vicuña cloak. 240
- 127 Provincial Commission, Province of La Rioja.—Vicuña cloak and shawl. 240
- 128 Provincial Commission, Province of San Juan.—Vicuña cloak and shawl. 240
- 129 Commission of the Province of Córdoba.—Vicuña counterpane. 240
- 130 Romero, Petrona, Province of Catamarca.—Spindle, with Vicuña wool. 240
- 131 Herrera, Simona, Province of Catamarca.—Spindle, with Vicuña wool. 240

Silk and Silk Fabrics.

- 132 Echevarria, Cecillo, Province of Santa Fé.—Silk in cocoons. 242
- 133 Begner, Federico, Province of Santa Fé.—Silk in cocoons from Colonia San Agustin.

Silk, Clothing, Fancy Goods.

- 134 Sub-Commission of San Carlos, Province of Santa Fé.—Silk, spun and in cocoons. 242
- 135 Invernizza, Juan, & Toschini, J., Paraná, Province of Entre-Rios.—Silk, spun and in cocoons. 242
- 136 Pouget, Miguel, Province of Mendoza.—Silk in cocoons. 242
- 137 Victoria, Enrique, Province of Buenos Ayres.—Cocoons. 242

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 138 Mintaner & Bermudéz, Province of Buenos Ayres.—Shirts. 250
- 139 Donato, Fortunato, Province of Buenos Ayres.—Child's suit. 250
- 140 Videla, Juan, Province of Buenos Ayres.—Leggings worn by the Argentine army. 250
- 141 Madueño, Jova, Province of Catamarca.—Vicuña handkerchief, neckties, gloves, etc. 251
- 142 Buasso, Lorenzo, Province of Buenos Ayres.—Boots and shoes made of domestic material. 251
- 143 Rodriguez & Sangronis, Province of Buenos Ayres.—Boots. 251
- 144 Buffeti & Maya, Province of Buenos Ayres.—Hats. 251
- 145 Heully, Marie, Province of Buenos Ayres.—Hats. 251
- 146 Valdes, Emiliano, & Cipriano, Province of Buenos Ayres.—Boots. 251
- 147 Provincial Commission, Province of Tucuman.—Boots and shoes; hats. 251
- 148 Provincial Commission, Province of Corrientes.—Palm-leaf hats. 251
- 149 Nicolas, Franciscos, Province of Corrientes.—Boots made of lizard skin. 251
- 150 Provincial Commission, Province of Córdoba.—Shoes and kid boots. 251
- 151 Machado, Ruben, Province of Catamarca.—Aibé straw hat. 251
- 152 Provincial Commission, Province of San Juan.—Wool hats. 251
- 153 Bouillet, Lewis, & Isodoro Ibarre, Province of Santa Fé.—Gaiters; wolf and otter fur hats. 251
- 154 Barelli é Hijos, Francisco, Province of Santa Fé.—Boots. 251
- 155 Treolar, Guillermo A., Province of La Rioja.—Shoes worn by Argentine miners. 251
- 156 Commission of the Province of Salta.—Boots, gaiters, cloth for hats, and vicugna wool hats. 251
- 157 Commission of the Province of Jujui.—Wool hats. 251
- 158 Provincial Commission, Province of San Luis.—Cortadera straw hats. 251
- 159 Provincial Commission, Province of Corrientes.—Embroideries, laces, trimmings, ornaments, etc. 251
- 160 Cabral, Juana T., Province of Corrientes.—Embroidered tidies, doylies. 251
- 161 Silva, Mercedes, Province of Corrientes.—Embroidered cloth, napkins, handkerchiefs, and chemises. 252
- 162 Pampin, Carmen, Province of Corrientes.—Embroidered cloth. 252
- 163 De Colodrero, M. Cabral, Province of Corrientes.—Crochet tray cloth, table cloth. 252
- 164 Lagraña, Sinforosa, Province of Corrientes.—Embroidered shawls. 252
- 165 Torrent, Eloiza G., Province of Corrientes.—Embroidered chemise and handkerchief. 252
- 166 De Anzotegui, Escolastica S., Province of Corrientes.—Embroidered towel. 252
- 167 Pujol, Leonor, Province of Corrientes.—Embroidered chemises and towels. 252
- 168 De Barras, Angela E., Province of Corrientes.—Embroidered cloth. 252
- 169 Mantilla, Pilar, Province of Corrientes.—Embroidered shirts. 252
- 170 Mantilla, Francisca, Province of Corrientes.—Embroidered shirts. 252
- 171 De Enriguez, Anastasia Gonzalez, Province of Corrientes.—Embroidered quilt. 252
- 172 Perichon, Telesfora, Province of Corrientes.—Embroidered fabric. 252
- 173 Mantilla, Concepcion, Province of Corrientes.—Shawls, thread lace table covers. 252
- 174 General Ferré's Widow, Province of Corrientes.—Embroidered cotton shirts. 252
- 175 Arguello, Ezequiel, Province of Córdoba.—Feather mats. 252
- 176 Provincial Commission, Province of Córdoba.—Embroidered saddle bags, tuckers, towels, pillow case, and insertions. 252
- 177 Alegre, Juan Fray, Province of Corrientes.
a Work box, containing spools of cotton. 230
b Laces, cocoanut rings. 254
- 178 Commission of the Province of San Juan.—Leather belts. 254
- 179 Commission of the Province of San Jujui.—Embroidered leather belts. 252
- 180 Provincial Commission, Province of Tucuman.—Leather belts. 254
- 181 Provincial Commission, Province of Catamarca.—Crotch quilt and towels. 252
- 182 Avellaneda, Nicomedes, Province of Catamarca.—Embroidered towel. 252
- 183 Caballi, Cristobal, Province of San Juan.—Chasuble embroidered in colors. 252
- 184 De Klappenbach, Sofia, Province of San Juan.—Embroidered handkerchief. 252
- 185 Tello, Juana, Province of San Juan.—Embroidered handkerchief. 252
- 186 The Provincial Commission, Province of Santa Fé.—Embroidered towel. 252
- 187 Commission of the Province of Tucuman.—Towels; tuckers for chemises. 252
- 188 Provincial Commission, Province of La Rioja.—Crochet and lace work, ornamental watch cases, embroidered tuckers, pillow cases, and napkins. 252

Clothing, Fancy Goods, Weapons, Medicines.

- 189 Commission of the Province of Salta.—Embroidered North American flags. 252
- 190 Commission of the Chaco Argentine Territory.—Embroidered cloth. 252
- 191 Commission of the Province of Santiago del Estero.—Embroidered counterpanes, netted towels, linen towels, and tuckers. 252
- 192 Provincial Commission, Province of San Luis.—Laces, embroidered underwear, church carpet, and other needle work. 252
- 193 Bustos, Mariano, Province of San Luis.—Religious pictures embroidered in silk. 252
- 194 Videla, Rosa, Province of San Luis.—Embroidered paper case. 252
- 195 Public School of "Las Conchas," Province of Buenos Ayres.—Embroidered pillow and child's shirt, made by the scholars. 252
- 196 Gimenez, José, Province of Buenos Ayres.—Silk sash, with the Argentine and American colors. 252
- 197 Balugera, Angela, Province of Entre Rios.—Gold and silk embroidered writing case. 252
- 198 Balugera, Elena, Province of Entre Rios.—Embroidered velvet pillow. 252
- 199 Benevolent Society of Paraná, Province of Entre Rios.—Crochet counterpane; tucker; embroidered handkerchief. 252
- 200 Etcheveherre, G., Province of Entre Rios.—Embroidered handkerchief, dedicated to the President of the United States. 252
- 201 Benevolent Society, Province of Entre Rios.—Linen napkins. 252
- 202 Clarke, Roberto, Province of San Luis.—Silver rings made by the Indians. 253
- 203 Grande, Rosario, Province of Buenos Ayres.—Gold necklace and medallion, representing the fourteen Argentine Provinces. 253
- 204 Lopez, Feliciano.—Cocoanut rings made of Mabocaya palm, by the Indians. 253
- 205 Pujol, Leonor, Province of Corrientes.—Flower made of hair. 254
- 206 Gonzalez, Damiana, Province of Corrientes.—Artificial flower wreath. 254
- 207 Etchevehère, Irene, Province of Entre-Rios.—Artificial flowers. 254
- 208 Bourgeois N., Province of Buenos Ayres.—Hair picture. 254
- 209 Provincial Commission, Province of La Rioja.—Hair watch chain, screen. 254
- 210 Commission of the Province of Cordoba.—Silver tinder box. 254
- 211 Ferrer, Eleucadia, Province of Cordoba.—Flowers made of seeds. 254
- 212 Sub-Commission of Andalgalá, Province of Catamarca.—Artificial flowers. 254
- 213 Guntzsch, J., & Schröder, Province of Buenos Ayres.—Trunks. 255

- 214 Mattaldi, Eugenio, Province of Buenos Ayres.—Trunk which can be transformed into a sofa, with writing desk, etc. 255
- 215 Grest, M., & Co., Province of Santa Fé.—Trunk. 255
- 216 Commission of the Province of Salta.—Leather bags. 255
- 217 Commission of the Province of Jujui.—Leather traveling bag. 255
- 218 Commission of the Province of Cordoba.—Leather traveling bags. 255

Paper, Blank Books, and Stationery.

- 219 Benelische, Federico, Province of Buenos Ayres.—Blank books, diaries, and bindings. 261

Weapons, etc.

- 220 Provincial Commission, Province of Corrientes.—Indian bows, arrows, clubs, and lances. 265
- 221 Roibon, Federico, Province of Corrientes.—Bow and arrows of the Chaco Indians. 265
- 222 Commission of the Chaco Argentine Territory.—Arrows of the Chaco Indians. 265
- 223 Commission of the Province of Salta.—Bows and arrows used by the Indians. 265
- 224 Commission of the Province of Jujui.—Slings to catch cattle and alpaca. 269
- 225 Valdez, Honorio, Province of Buenos Ayres.—Lassoos. 269

Medicine, Surgery, Prothesis.

- 226 Arteaga, A., Province of Santa Fé.—Sarsaparilla. 272
- 227 Rosquellas, Julian, Province of Santa Fé.—Medicines for animals. 272
- 228 Lagos, José M., Province of Buenos Ayres.—Maxwelina, to cure the itch in sheep. 272
- 229 Puertas, Lorenzo, Province of San Luis.—Cholera medicine. 272
- 230 Cardalda, Inocencio, Province of Buenos Ayres.—Iodoform and pepsin. 272
- 231 Cabrera, Mauro, Province of Buenos Ayres.—Horse medicine. 272
- 232 De Cornejo, Melchora, Province of Salta.—Sarsaparilla. 272
- 233 Provincial Commission and D. Abraham Lemos, Province of Mendoza.—Herbarium of the officinal flora of the Province. 272
- 234 Roman, Medardo, Province of Mendoza.—Wild fennel. 272
- 235 Provincial Commission, Province of San Luis.—Medicinal herbs. 272
- 236 Molina, Angela, Province of Catamarca.—Sudorific and digestive substances; cedron de puna, for affections of the lungs. 272
- 237 Iturbe, Fidel, Province of Catamarca.—Pharmaceutical preparation. 272
- 238 Castelo, Guadalupe, Province of Catamarca.—Medicinal herbs and plants. 272

Medicines, Surgical Appliances, Vehicles, Saddlery.

- 239 Hurley, Tomas, Province of Catamarca.—Medicinal herbs. 272
- 240 Quevedo, Samuel A., Lafane, Province of Catamarca.—Medicinal herbs. 272
- 241 Wurffbain, Gustavo, and the Provincial Commission, Province of La Rioja.—Herbarium composed of herbs and medicinal plants. 272
- 242 Gonzalez, Joaquin, Province of La Rioja.—Medicinal plants and herbs. 272
- 243 Gelos, Martin, Province of La Rioja.—Spurge, from which castor oil is extracted. 272
- 244 Larrahona, Petro, Province of La Rioja.—Seed of castor oil plant. 272
- 245 Justice of the Peace of La Ensenada, Province of Buenos Ayres.—Sarsaparilla. 272
- 246 Aguilar, Francisco, Province of Buenos Ayres.—Medicinal herbs. 272
- 247 Valdez, E. & C., Province of Buenos Ayres.—Chamomile, borage, sponge, sarsaparilla, sage, etc. 272
- 248 Gonzales, Juan, Province of Buenos Ayres.—Medicinal herbs. 272
- 249 Iniguez, Dalmira, Province of Buenos Ayres.—Medicinal herbs. 272
- 250 Provincial Commission, Province of Buenos Ayres.—Medicinal herbs. 272
- 251 Ferrer, Vicente, Province of Corrientes.—Medicinal herbs. 272
- 252 Roibon, Enrique, Province of Corrientes.—Herbarium. 272
- 253 Sub-Commission of Bella-Vista, Province of Corrientes.—Tartago seed, chamico, etc. 272
- 254 Lopez, Feliciano, Province of Corrientes.—Medicinal herbs. 272
- 255 Provincial Commission, and Sola, Juan, Province of Salta.—Medicinal herbs. 272
- 256 Provincial Commission, Province of Cordoba.—Medicinal herbs and plants. 272
- 257 Fontes, Vicente Martinez, Province of Entre Rios.—Medicinal herbs. 272
- 258 Commission of Parana, Province of Entre Rios.—Medicinal herbs. 272
- 259 Berdie, M., Province of Entre Rios.—Medicinal water. 272
- 260 Commission of the Parana, Province of Entre Rios.—Berros waters and medicinal herbs. 272
- 261 Rodriguez, Victor, Province of San Juan.—Saffron, flax seed. 272
- 262 Doncel, Rosauero, Province of San Juan.—Anise. 272
- 263 Rodriguez, Severo, Province of San Juan.—Mustard. 272
- 264 Espada, Amadeo, Province of San Juan.—Pennyroyal, etc. 272
- 265 Rodriguez, Severo, Province of San Juan.—Flax, anise. 272
- 266 Poblete, Tiburcio, Province of San Juan.—Medicinal seeds, herbs, and plants. 272
- 267 Provincial Commission, Province of Santiago del Estero.—Medicinal herbs. 272
- 268 Lacour, Guillermo, Province of Buenos Ayres.—Orthopedic apparatus. 276
- 269 Newbery, Rodolfo, Province of Buenos Ayres.—Artificial teeth. 277
- Fabrics of Vegetable, Animal, or Mineral Materials.**
- 270 Provincial Commission, Province of Cordoba.—Ostrich feather dusters. 286
- 271 Provincial Commission, Province of Salta.—Feather dusters and brooms from Totorá. 286
- 272 Balvidares, Victorino, Province of Buenos Ayres.—Rope braided with bristles. 287
- Carriages, Vehicles, and Accessories.**
- 273 Peñalva, Benito, Province of Buenos Ayres.—Horse belt. 296
- 274 Videla, Juan, Province of Buenos Ayres.—Harness. 296
- 275 Provincial Commission, Province of Buenos Ayres.—Silver spurs. 296
- 276 Guntsche, J., & Schröder, Province of Buenos Ayres.—Saddles. 296
- 277 Mattaldi, Eugenio, Province of Buenos Ayres.—Saddles and harness. 296
- 278 Provincial Commission, Province of San Juan.—Saddlery and harness. 296
- 279 Tirapegui, Ramon, Province of San Juan.—Mexican saddle, stirrups, bridles, etc. 296
- 280 Rodriguez, Victor, Province of San Juan.—Harness and stirrups. 296
- 281 Rodriguez, Severo, Province of San Juan.—Spurs and horse cloth. 296
- 282 Crest, M., & Co., Province of Santa Fé.—Pack saddle used by the army, leather girth, etc. 296
- 283 Provincial Commission, Province of Santa Fé.—Horse cloths, tapir leather reins and surcingle. 296
- 284 Provincial Commission, Province of Tucuman.—Leather caparisons, saddlery, lassoos, etc. 296
- 285 Provincial Commission, Province of Cordoba.—Harness, saddlery, horse cloth, etc. 296
- 286 Provincial Commission, Province of San Luis.—Bristle horse cloth, ostrich feather and other caparisons. 296
- 287 Escobar, Juan de D., Province of San Luis.—Stirrups, braided shackles, girth, and reins. 296
- 288 Sosa, Rafael, Province of San Luis.—Ostrich feather caparison. 296
- 289 Provincial Commission, Province of Salta.—Pack-saddle, girth, straps, head stall, tapir leather reins, caparisons, lassoos, etc. 296
- 290 Provincial Commission, Province of Catamarca.—Vizcacha leather caparison, and braided lasso. 296
- 291 Andalgala Commission, Province of Catamarca.—Horse cloth, harness, girths, reins, bridles, etc. 296
- 292 Gigena, Justiniano, Province of Catamarca.—Horse cloth. 296
- 293 Gonzalez, Daniel, Province of Mendoza.—Horse cloths. 296
- 294 Provincial Commission, Province of Mendoza. 296
- 295 Commission of the Province of Jujui.—Tapir leather reins, bridle, etc. 296

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DEPARTMENT III.—EDUCATION AND SCIENCE.

EDUCATIONAL SYSTEMS, METHODS, AND LIBRARIES.

CLASS 300.—Elementary instruction. Infant schools and kindergartens, arrangements, furniture, appliances, and modes of training.

Public schools, graded schools, buildings and grounds, equipments, courses of study, methods of instruction, text-books, apparatus, including maps, charts, globes, etc.; pupils' work, including drawing and penmanship; provisions for physical training.

CLASS 301.—Higher education. Academies and high schools.

Colleges and universities. Buildings and grounds; libraries, museums of zoology, botany, mineralogy, art, and archeology; apparatus for illustration and research, mathematical, physical, chemical, and astronomical courses of study; text-books, catalogues, libraries, and gymnasiums.

CLASS 302.—Professional schools, theology, law, medicine, and surgery, dentistry, pharmacy, mining, engineering, agriculture, and mechanical arts, art and design, military schools, naval schools, normal schools, commercial schools, music.

Buildings, text-books, libraries, apparatus, methods, and other accessories for professional schools.

CLASS 303.—Institutions for instruction of the blind, deaf, and dumb, and the feeble-minded.

CLASS 304.—Education reports and statistics.

National bureau of education.

State, city, and town systems.

College, university, and professional systems.

CLASS 305.—Libraries, history, reports, statistics, and catalogues.

CLASS 306.—School and text-books, dictionaries, encyclopædias, gazetteers, directories, index volumes, bibliographies, catalogues, almanacs, special treatises, general and miscellaneous literature, newspapers, technical and special newspapers and journals, illustrated papers, periodical literature.

INSTITUTIONS AND ORGANIZATIONS.

CLASS 310.—Institutions founded for the increase and diffusion of knowledge. Such as the Smithsonian Institution, the Royal Institution, the Institute of France, British Association for the Advancement of Science, and the American Association, etc., their organization, history, and results.

CLASS 311.—Learned and scientific associations. Geological and mineralogical societies, etc. Engineering, technical, and professional associations. Artistic, biological, zoological, medical schools, astronomical observatories.

CLASS 312.—Museums, collections, art galleries, exhibitions of works of art and industry. Agricultural fairs, state and county exhibitions, national exhibitions. International exhibitions.

Scientific museums and art museums.

Ethnological and archeological collections.

CLASS 313.—Music and the drama.

SCIENTIFIC AND PHILOSOPHICAL INSTRUMENTS AND METHODS.

CLASS 320.—Instruments of precision, and apparatus of physical research, experiment, and illustration.

Astronomical instruments and accessories, used in observatories.

Transits, mural circles, equatorials, collimators.

Geodetic and surveying instruments. Transits, theodolites, needle compasses. Instruments for surveying underground in mines, tunnels, and excavations.

Nautical astronomical instruments. Sextants, quadrants, repeating circles, dip-sectors.

Leveling instruments and apparatus. Carpenters' and builders' levels, hand levels, water levels, engineers' levels.

Instruments for deep-sea sounding and hydrographic surveying.

Meteorological instruments and apparatus.

Thermometers, pyrometers.

Barometers.

Hygrometers and rain gauges.

Maps, bulletins.

Blanks for reports, methods of recording, reducing, and reporting observations.

CLASS 321.—Indicating and registering apparatus, other than meteorological; mechanical calculation.

Viameters, pedometers, perambulators.

Gas meters.

Water meters, current meters, ships' logs, electrical logs.

Tide registers.

Apparatus for printing consecutive numbers.

Counting machines, calculating engines, arithmometers.

CLASS 322.—Weights, measures, weighing and meteorological apparatus.

Measures of length; graduated scales on wood, metal, ivory, tape, or ribbon; steel tapes, chains, rods, verniers, rods, and graduated scales for measuring lumber, goods in packages, casks, etc., gaugers' tools and methods.

Measures of capacity for solids and liquids.

Weights. Scales and graduated beams for weighing; assay balances, chemical balances. Ordinary scales for heavy weights; weighing locomotives and trains of cars. Postal balances. Hydrometers, alchometers, lactometers, etc.; gravimeters. (*See Class 571.*)

CLASS 323.—Chronometric apparatus.

Chronometers. Astronomical clocks. Church and metropolitan clocks. Ordinary commercial clocks. Pendulum and spring clocks. Marine clocks. Watches. Ciepsydras, hour glasses, sun dials. Chronographs, electrical clocks. Metronomes.

CLASS 324.—Optical and thermotic instruments and apparatus.

Mirrors, plane and spherical.

Lenses and prisms.

Spectacles and eyeglasses, field and opera glasses, graphoscopes and stereoscopes.

Cameras and photographic apparatus.
 Microscopes.
 Telescopes.
 Apparatus for artificial illumination, including electric, oxyhydrogen, and magnesium light.
 Stereopticons.
 Photometric apparatus.
 Spectroscopes and accessories for spectrum analysis.
 Polariscopes, etc.
 Thermotic apparatus.

CLASS 325.—Electrical apparatus.

Friction machines.
 Condensers and miscellaneous apparatus to illustrate the discharge.
 Galvanic batteries and accessories to illustrate dynamical electricity.
 Electro-magnetic apparatus.
 Induction machines, Runkorff coils, etc.
 Magnets and magneto-electrical apparatus.

CLASS 326.—Telegraphic instruments and methods.

Batteries and forms of apparatus used in generating the electrical currents for telegraphic purposes.
 Conductors and insulators, and methods of support, marine telegraph cables.
 Apparatus of transmission; keys, office accessories, and apparatus.
 Receiving instruments, relay magnets, local circuits.
 Semaphore and recording instruments.
 Codes, signs, or signals.
 Printing telegraphs for special uses.
 Electrographs.
 Dial or cadran systems.
 Apparatus for automatic transmission.

CLASS 327.—Musical instruments and acoustic apparatus.

Percussion instruments, drums, tamborines, cymbals, triangles.
 Pianos.
 Stringed instruments other than pianos.
 Automatic musical instruments, music boxes.
 Wind instruments of metal and of wood.
 Harmoniums.
 Church organs and similar instruments.
 Speaking machines.
 Vocal music.

ENGINEERING, ARCHITECTURE, CHARTS, MAPS, AND GRAPHIC REPRESENTATIONS.

(For Agricultural Engineering, see Class 630.)

(For Mining Engineering, see Class 120.)

CLASS 330.—Civil engineering. Land surveying, public lands, etc.

River, harbor, and coast surveying. Construction and maintenance of roads, streets, pavements, etc. Surveys and location of towns and cities, with systems of water supply and drainage. Arched bridges of metal, stone, brick, or beton. Trussed girder bridges. Suspension bridges. Canals, aqueducts, reservoirs, construction of dams. Hydraulic engineering and means of arresting and controlling the flow of water.

Submarine constructions, foundations, piers, docks, etc.

- CLASS 331.—Dynamic and industrial engineering. Construction and working of machines; examples of planning and construction of manufacturing and metallurgical establishments.
- CLASS 332.—Railway engineering. Location of railways, and the construction and management of railways.
- CLASS 333.—Military engineering.
- CLASS 334.—Naval engineering.
- CLASS 335.—Topographical map. Marine and coast charts.
Geological maps and sections.
Botanical, agronomical, and other maps, showing the extent and distribution of men, animals, and terrestrial products. Physical maps.
Meteorological maps and bulletins. Telegraphic routes and stations.
Railway and route maps. Terrestrial and celestial globes. Relief maps and models of portions of the earth's surface. Profiles of ocean beds and routes of submarine cables.
- PHYSICAL, SOCIAL, AND MORAL CONDITION OF MAN.
- CLASS 340.—Physical development and condition.
The nursery and its accessories.
Gymnasiums, games, and manly sports. Skating, walking, climbing, ball-playing, acrobatic exercises; rowing, hunting, etc.
- CLASS 341.—Alimentation. Markets; preparation and distribution of food.
- CLASS 342.—The dwelling. Sanitary conditions and regulations. Domestic architecture.
Dwellings characterized by cheapness, combined with the conditions essential to health and comfort.
Fire-proof structures.
Hotels, club-houses, etc.
Public baths.
- CLASS 343.—Commercial systems and appliances.
Mercantile forms and methods, counting-houses and offices.
Banks and banking.
Saving and trust institutions.
Insurance; fire, marine, life, etc.
Commercial organizations, boards of trade, merchants', produce, and stock exchanges.
Corporations for commercial and manufacturing purposes.
Railway and other transportation companies.
Building and loan associations.
- CLASS 344.—Money. Mints and coining.
Collections of current coins.
Historical collections.
Tokens, etc.
Bank notes and other paper circulating mediums.
Commercial paper, bills of exchange, etc.
Securities for payment of money, stocks, bonds, mortgages, ground rents, quit rents.
Precautions against counterfeiting and misappropriation of money.
- CLASS 345.—Government and law. Various systems of government.
Departments of government. Revenue and taxation, military organization, executive powers, legislative forms and authority, judicial functions and systems, police regulations, government charities.
International relations; international law; diplomatic and consular service, etc., allegiance and citizenship; naturalization.
Codes.

Municipal government.

Protection of property in inventions.

Postal system and appliances.

Punishment of crime.

Prisons and prison management and discipline; police stations; houses of correction; reform schools; naval or marine discipline; punishment at sea.

CLASS 346.—Benevolence. General hospitals.

Special hospitals for the eye and ear, for women, etc.

Hospitals for contagious and infectious diseases.

Hospitals for the insane—under State control, and private asylums.

Quarantine systems and organizations.

Sanitary regulations of cities.

Dispensaries.

Inebriate asylums.

Lying-in asylums.

Magdalen asylums.

Asylums for infants and children. Foundling and orphan asylums, children's aid societies.

Homes for the aged and infirm; homes for aged men and women; soldiers' homes; homes for the maimed and deformed; sailors' homes.

Treatment of paupers. Almshouses, feeding the poor, lodging houses.

Emigrant aid societies.

Treatment of aborigines.

Prevention of cruelty to animals.

CLASS 347.—Co-operative associations.

Political societies and organizations.

Military organizations and orders.

Trade unions and associations.

Industrial organizations.

Secret orders and fraternities.

CLASS 348.—Religious organizations and systems. Origin, nature, growth, and extent of various religious systems and faiths. Statistical, historical, and other facts.

Religious orders and societies, and their objects.

Societies and organizations for the propagation of systems of religion by missionary effort.

Spreading the knowledge of religious systems by publications.

Bible societies, tract societies, colportage.

Systems and methods of religious instruction and training for the young.

Sunday-schools, furniture and apparatus.

Associations for religious or moral improvement.

Dispensing charities, church guilds.

CLASS 349.—Art and industrial exhibitions. Agricultural fairs, state and county exhibitions, national exhibitions, international exhibitions, international congresses, etc.

UNITED STATES.

School Books, Furniture, Apparatus, Statistics.

Educational Systems, Methods, and Libraries.

- 1 Barnes, A. S., & Co., New York, N. Y.—School books, maps, charts, etc. T 73 to 78. 300
- 2 New York Silicate Book Slate Co., New York, N. Y.—School book slates, liquid blackboard slating, blackboards on wall, cloth, and paper. T 68. 300
- 3 Smith, J. L., Philadelphia, Pa.—Maps, map rollers and cases, drawing paper, map work. T 73 to 78. 300
- 4 Moeller, Peter W., New York, N. Y.—Adjustable blackboard frame. Q 78. 300
- 5 Nims, H. B., & Co., Troy, N. Y.—Terrestrial and celestial globes. P 77. 300
- 6 Bancroft, J. A., & Co., Philadelphia, Pa.—School desks, seats, and merchandise; Sunday-school and church furniture. T 51. 300
- 7 Mitchell, S. A., Philadelphia, Pa.—Atlases, maps, engravings, etc. T 73 to 78. 300
- 8 Schermerhorn, J. W., & Co., New York, N. Y.—Books, charts, and modern school material. T 73 to 78. 300
- 9 Peirce, I. Newton, Philadelphia, Pa.—Combination desks, seats, settee, blackboard, model of a log cabin school house, maps. (*Pennsylvania Educational Building.*) 300
- 10 Steiger, E., New York, N. Y. T 73 to 78.
 - a Kindergarten material. 300
 - b French and German school books, reading charts, automatic tellurian, globes, relief maps. T 73 to 78. 306
- 11 Cowperthwait & Co., Philadelphia, Pa. T 73 to 78.
 - a Text books and wall maps for schools. 300
 - b Illustrated works. 306
- 12 Sower, Potts, & Co., Philadelphia, Pa. T 73 to 78.
 - a Outline wall maps. 300
 - b Normal school books. 301
 - c Publications of five generations of Sower family. 306
- 13 Ditson, J. E., & Co., Philadelphia, Pa.—Sheet music. T 73 to 78. 302

Stevens Institute of Technology, Hoboken, N. J.—Models, drawings, apparatus of engineering, etc.; testing machines for lubricants, autographic testing machine for materials of construction. T 67. 302
- 15 Hampton Normal and Agricultural Institute, Hampton, Va.—Views, oil paintings, ground plan of building and of experimental farm; photographs of building and of students, examination papers. (*South Gallery.*) 302
- 16 State of Indiana Educational Department (by S. H. Smart, Indianapolis).—Bound volumes of examination manuscripts, by pupils of schools at Indianapolis, Evansville, Terre Haute, Fort Wayne, Logansport, Richmond, Goshen, Plymouth, Bedford, Huntington, Elkhart, Lawrenceburg, Mishawaka, Kokomo, Vevay, Delphi, Franklin, Bartholomew county, Martinville, Salem, Vanderburg county, and Wayne county.

Reports and works of Indiana authors.
Drawings from schools.
"Indiana School Journal," plans of buildings, maps of cities, school blanks, etc.
Herbariums and botanical specimens prepared by pupils of schools at Bedford and Indianapolis.
School apparatus from Terre Haute.
Specimens from Owen cabinet.
Mineral collection by pupils of Huntington schools.
Electrical apparatus for weighing under glass, invented by Prof. H. W. Wiley, Purdue University.
Chemical products by pupils of Purdue University.
Indiana fishes prepared by Prof. Cope-land, of Indianapolis High School.
Zoological specimens prepared by pupils of Indianapolis High School.
Native woods of Huntington county, by pupils of Huntington city schools.
Drawings from Fort Wayne, Indianapolis, and La Fayette schools.
Photographed blackboard work, specimens of penmanship and written music from Indianapolis schools.
School law of the State, condensed.
Photographed blackboard work from La Fayette, Fort Wayne, and Terre Haute schools.
Photographs of prominent educators.
Primary work of Indianapolis and Fort Wayne schools.
Models of Ward and High School buildings at Indianapolis, Fort Wayne, Evansville, Muncie, Terre Haute, and La Fayette.
Model of log school house, the first built in Delaware county, Indiana.
Charts, exhibiting school system and its growth, and the college system of the State.
Banners, exhibiting school system, statistics, distribution of school houses, and the

School Books, Furniture, Apparatus, Statistics.

growth of the system in twenty years by semi-decades.

Banners showing Purdue, Asbury, and State Universities, Wabash, Union, Christian, and Eastham Colleges.

Banners showing State and Northern Indiana normal schools, and Indianapolis and Huntington city systems. (*South Gallery.*) 304

- 17 **State of Michigan** (F. W. Noble, Secretary, Detroit, Mich.).—Michigan school system, its history, statistics, plans, elevations, interior views, and students' work in public, primary, graded, and high schools, universities, and colleges. Rare birds and marine and land animals from museum of Michigan University. (*South Gallery.*) 304

- 18 **State of Wisconsin Educational Department** (by Edward Searing, Superintendent of Public Instruction).—Students' work, photographs of school buildings, educational map, books, etc. (*South Gallery.*) 304

- 19 **Educational Exhibit of Ohio** (by Chas. S. Smart).—Statistical and documentary history of education in Ohio. (*South Gallery.*) 304

- 20 **State of Rhode Island Board of Education**, Providence, R. I. (by L. B. Stockwell).—History and statistics, school work, school houses. (*South Gallery.*) 304

- 21 **State of New Hampshire, Department of Public Instruction** (by John W. Simonds, State Superintendent, Franklin, N. H.).—Kindergarten school—Specimens of kindergarten work. Public schools—Slates covered with work of primary pupils; specimens of scholars' written work, and examinations, compositions, drawings, penmanship; maps and plans; photographs and plans of school buildings and rooms; photographs of school superintendents and teachers; illustrated school register; wooden model of school-house.

Academies, seminaries, and high schools—Photographs and plans of buildings and rooms; photographs of teachers and students; students' written work, drawings, etc.

Dartmouth College—Manuscript history of college; bound catalogues and pamphlets, students' examination papers, drawings, illustrated programme, map of grounds, portraits of faculty and class of 1876; plans and views of buildings and rooms.

State Normal School—Reports; students' written work, photographs of buildings and rooms.

Thayer School of Engineering—Model Pratt truss railroad bridge.

Chandler Scientific School—Drawings, surveying papers, railroad map, models in plaster, examination papers and abstracts, essays.

Agricultural College—Geological map.

Educational chart and history of education in the State; history of education in towns and cities.

State school laws, reports, and registers; town school reports, history and catalogue of academies, etc.; records of normal school; Bouton's provincial papers.

Educational publications; histories of towns; text-books used 100 years ago; text-books in present use. (*South Gallery.*) 304

- 22 **State of Connecticut Educational Department** (by B. G. Northrop, Secretary,

Hartford, Conn.).—Work by scholars and Chinese students; photographs of school-houses; works by former members of Yale College. (*South Gallery.*) 304

- 23 **State of Illinois, Department of Public Instruction** (by S. M. Etter, Superintendent).—Reports of the department, and history of education in the State.

Public schools.—Pupils' work.

Colleges and Seminaries.—Work of students, museums, etc.

Industrial University, Champaign, Ill.—Books, portfolios, and charts, containing work of students.

Illinois Normal Schools.—Work of students, museums, etc. (*South Gallery.*) 304

- 24 **State of Maine, Educational Department** (by Warren Johnson, State Superintendent, Augusta, Maine).

Kindergarten school, Lewiston; public schools in Portland, Bangor, Bath, Lewiston, Calais, Augusta, and various other cities and towns; private schools; Johnson Home School for Boys; Abbott School for Boys; St. Catharine's School for Girls, and others. School furniture from Doyle Bros., Bangor.

Bowdoin College, Colby University, Bates College.

Maine Wesleyan Seminary and Female College, Westbrook Seminary, Waterville Classical Institute, Maine Central Institute, Hallowell Classical Institute, and others; Western Normal School; Farmington and Eastern Normal School, Castine.

State collection of agriculture and mechanic arts. (*South Gallery.*) 304

- 25 **State of Iowa, Educational Department** (by Alonzo Abernethy, Des Moines).—Collective exhibit of the public schools of Davenport, Des Moines, Atlantic, Muscatine, Ottumwa, Maringo, Boone, Sigourney, Winterset, Lyons, Indianola, Wheatland, Clarence, and Osceola, and of Oskaloosa and Western Colleges, Iowa. Reports, charts, drawings, and examination manuscripts.

Iowa School Furniture Co.—School desks and seats. (*South Gallery.*) 304

- 26 **State of Tennessee Educational Department**, collective exhibit.

Trousdale, Leon, State Superintendent of Schools, Nashville, Tenn.—Reports and school banner.

Dean, John R., County Superintendent, Shelbyville, Tenn.—Manuscripts of pupils of the schools, and school banner.

Presnell, H., County Superintendent of Schools, Jonesboro, Tenn.—Photographs of Colored Training School and South Normal School buildings.

Pickett, A., City Superintendent of Schools, Memphis, Tenn.—Examination manuscripts and principles of instruction; geographical drawings.

Caldwell, S. Y., City Superintendent, Nashville, Tenn.—Examination manuscripts, drawings, school banner, and annual reports.

Perkins, W. H., Principal Peabody Graded School, Powell's Station, Tenn.—Examination manuscripts of classes D and C, second grade.

Tennessee Medical Society, Nashville, Tenn.—Transactions of the session, 1845.

Lindsley, J. Berrian, Nashville, Tenn.—Life and works of Philip Lindsley.

Giers, C. C., Nashville, Tenn.—Photographs of educators. (*South Gallery.*) 304

School Books, Furniture, Apparatus, Statistics.

27 Commonwealth of Massachusetts. Department of Education.—Mineralogical specimens for common schools; drawing and work on slates from common and primary schools; industrial drawing; scholars' work other than drawing; regulations and reports from Boston, New Bedford, Greenfield, Newton, Lowell, Fitchburg, Cambridge, Taunton, Worcester, Fall River, Springfield, Brookfield, Clinton, Essex, Waltham, Kingston, Lennox, Leominster, Spencer, Lancaster, Northampton, Stoneham, Pittsfield, and South Egremont. Writing copy books and charts from J. W. C. Gilman; books, music charts, and globe from Ginn Bros.; kindergartien apparatus from Milton, Bradley & Co.; school furniture from A. G. Whitcomb and J. L. Ross; Chauncy Hall and other school furniture from W. O. Haskell & Sons; crayons from Parmenter & Walker; charts, models, plates, and text-books from S. Edward Warren; art toys for kindergarten from W. C. Brigham; arithmetical cards from Miss M. H. Faxen and Miss Annie E. Walcutt; amateur drawing by Charles L. Adams, Dorchester.

Views, plans, and sites of State Normal schools, with stereoscope and stereoscopic views. Drawings from high schools and academies; photographs of Springfield, Waltham, and Gratton high schools; architectural drawings of Lawrence, Spencer, Peabody, and Salisbury high schools; photographs from Harvard University; photographs from Amherst College, catalogue of colleges and library, history of college and student life; catalogues, list of officers, and photographs from Williams College; photographs and catalogues from Boston College, and pamphlets from Boston University; view of Wellesley College, ground plans and site, interior views and reports; catalogues from Tufts College; views from College of the Holy Cross; photographs and architectural drawings from Agricultural College at Amherst; architectural illustrations, special reports, and documents from Laselle Female Seminary; architectural illustrations from Worcester Academy; documents, military equipments, special reports, and scholars' work from Chauncy Hall School; catalogues from Warren and Pierce Academies; reports from South Egremont Academy; photographs and historical report from Mount Holyoke Female Seminary; catalogue from Lawrence Academy, Gorton.

Drawing, painting, and modeling from State Normal Art School; drawings from Worcester County Free School of Industrial Science, mechanical products of scholars, theses, and illustrations of buildings; documents from Andover Theological Seminary; materials for instruction in industrial drawing, books, models in wood and plaster, instruments, etc.; drawings and designs from Peter Roos and E. Whitfield; anatomical preparation of the human brain by Dr. Denny; osseous anatomy of the ear, by Dr. Clarence J. Blake; annual reports and memoirs of Peabody Academy of Science, Salem; musical publications from Oliver Ditson & Co.

Books and apparatus from Perkins Institution for the Blind; photographs and historical reports from Clark Institution for the Dumb, Northampton; visible speech,

charts, and designs from A. Graham Dell. Annual reports of the Board of Education; annual reports of school committees from the eighteen cities and three hundred and twenty-three towns of the commonwealth; school reports from Paxton.

Supplement to report on technology; gas inspectors' reports; catalogues, documents, and tablet from Boston public library; history, catalogues, and pamphlets from Brighton public library; history and architectural illustrations from Concord public library; catalogues from Brookline, Haverhill, and Belmont public libraries; photographs and architectural drawings from Framingham, Lynn, and Worcester public libraries; catalogue from Paxton public library.

Periodical literature of the State. Drawing of the birthplace of Whittier; school text-books, from Brewer & Tileston and G. C. Merriam; life of Horace Mann, lectures and reports; genealogical works from J. M. Hawks; works on insects and animals, from A. S. Packard, jr.; bust and works of Nathaniel Bowditch, from H. I. Bowditch; book from Dr. Henness; tablet of metric system, from J. Pickering Putnam; philosophic works, from Francis Bowen; problem of health, from Reuben Green; work on the eye, from B. J. Jeffreys; book of zoology and scientific pamphlets, from Prof. E. S. Morse; *Psyche Advertiser*; text-books, from Schoenhof & Moeller; books from W. T. Adams, W. F. Draper, Sampson Davenport & Co., Greenough Co., Dean Dudley, Richard Briggs; text-books, from Taggard & Brown; work on trees of Massachusetts, from George B. Emerson; publications from Women's Education Society.

Publications from Medical Improvement Society and Natural History Society; pamphlets from Numismatic Society; register and memoirs from New England Historic Genealogical Society.

Bust of Prof. Agassiz, and architectural illustrations of Agassiz Museum; reports from Worcester Lyceum and Natural History Society; illustrations and description of mastodon from Warren Museum.

Historical reports from Handel and Haydn Society; philosophical instruments from N. M. Lowe; astronomical drawings from L. Trouvelot; astronomical instruments from Prof. Dolbeare; astronomical lantern from James Freeman Clarke; maps of the State of Massachusetts.

Computers with keys from J. E. Fuller. Health lift from W. A. Knight.

Reports of the Board of Health and State Charities; harbor commissioners' and gas inspectors' reports; reports from insurance and savings bank commissioners; pamphlet on life insurance from Elizur Wright; annual report from Boston Board of Trade.

Registration reports, public documents, acts, and resolves; reports of commissioners on inland fisheries; tax commissioners' report; views and plans of new state prison for women; photographs and reports from Westboro Reform School; architectural illustrations and reports from School for Neglected Children, Deer Island.

Reports, view, and plans of new state hospital at Danvers; architectural drawings, reports, and statistics from Northampton state lunatic hospital.

School Books, Furniture, Apparatus, Statistics.

- Reports from the House of the Angel Guardian.
Photographs from Hoosac tunnel.
Geological maps. (*South Gallery.*) 304
- 28 State of New Jersey, Department of Public Instruction** (by Ellis A. Apgar, Trenton, N. J.).—Work by school children, viz.: maps drawn from memory; mathematical operations; analysis and parsing; compositions; spelling; primary and miscellaneous work; artistic drawing in crayon, indian ink, and lead pencil; mineral and natural history collections; mechanical contrivances; photographic views, exterior and interior of school-houses, and decennial exhibit of their improvements, showing condition in 1866 and 1876; kindergarten work; penmanship; history of schools in New Jersey; works written by alumni of Princeton and Rutgers colleges, and photographic views of the same. (*South Gallery.*) 304
- 29 State of Pennsylvania.**—Educational exhibit shown in Pennsylvania Educational Hall.
- 30 Bartlett, John R., Providence, R. I.**—Catalogue of the library of the late John Carter Brown, relating to America. T 73 to 78. 305
- 31 Lippincott, J. B., & Co., Philadelphia, Pa.**—Various publications. T 77. 306
- 32 Porter & Coates, Philadelphia, Pa.**—Books. T 73 to 78. 306
- 33 Baker, Davis, & Co., Philadelphia, Pa.**—Zell's Encyclopedia, Hand Atlas, Cyclopedia of American Literature, and United States Business Directory. T 73 to 78. 306
- 34 Burley, S. W., Philadelphia, Pa.**—Historical, descriptive, and statistical books. T 73 to 78. 306
- 35 Holman, A. J., & Co., Philadelphia, Pa.**—Bibles and photograph albums. T 73 to 78. 306
- 36 Presbyterian Board of Publication, Philadelphia, Pa.**—Theological, practical, and Sabbath-school books, and periodicals. T 73 to 78. 306
- 37 Kohler, Ignatius, Philadelphia, Pa.**—German classic, theological, and miscellaneous books. T 73 to 78. 306
- 38 Allen, Henry S., New York, N. Y.**—History of America. T 73 to 78. 306
- 39 Wilson, Hinkle, & Co., Cincinnati, Ohio.**—Educational books. T 73 to 78. 306
- 40 Calmann, Chas., Philadelphia, Pa.**—Book of business firms in the United States. T 73 to 78. 306
- 41 Ivison, Blakeman, Taylor, & Co., New York, N. Y.**—School and college text-books; Spencerian system of penmanship. T. 73 to 78. 306
- 42 Graham, Andrew J., New York, N. Y.**—Phonographic works. T 73 to 78. 306
- 43 Butler, J. H., & Co., Philadelphia, Pa.**—Educational text-books and outline maps. T 73 to 78. 306
- 44 Wood, Wm., & Co., New York, N. Y.**—Medical books. T 73 to 78. 306
- 45 National Temperance Society, New York, N. Y.**—Temperance books, tracts, pamphlets, papers, diagrams, etc. T 73 to 78. 306
- 46 Bicknell, A. J., & Co., New York, N. Y.**—Books for builders. T 73 to 78. 306
- 47 Anglim, James, Washington, D. C.**—Biographical annals of the civil government of the United States. T 73 to 78. 306
- 48 Claxton, Remsen, & Haffelfinger, Philadelphia, Pa.**—Books, games, historical charts, Centennial Guide and map of Philadelphia. T 73 to 78. 306
- 49 Kelly, Thomas, New York, N. Y.**—Catholic prayer books and bibles. T 73 to 78. 306
- 50 Sheldon & Co., New York, N. Y.**—School and college text-books; theological, religious, miscellaneous, and juvenile books; "Galaxy" magazine. T 73 to 78. 306
- 51 Burlock, Saml. D., & Co., Philadelphia, Pa.**—Photograph albums, bibles, T 73 to 78. 306
- 52 Potter, John E., & Co., Philadelphia, Pa.**—Bible Encyclopedia, bibles, testaments, and standard miscellaneous books. T 73 to 78. 306
- 53 Baird, Henry Carey, & Co., Philadelphia, Pa.**—Practical, scientific, and economic books. T 73 to 78. 306
- 54 Orange Judd Co., New York, N. Y.**—"American Agriculturist" and rural books. T 73 to 78. 306
- 55 American Sunday-school Union, Philadelphia, Pa.**—Evangelical publications for Sunday-schools and families. T 73 to 78. 306
- 56 Appleton, D., & Co., Philadelphia, Pa.**—Books. T 73 to 78. 306
- 57 Gebbie & Barrie, Philadelphia, Pa.**—Fine art publications. N 71. 306
- 58 Roberts, Rev. H. Floy, Williamsburgh, N. Y.**—Manuscript interlinear New Testament; the original Greek text, verbally translated, compared with our English version. T 73 to 78. 306
- 59 Asher & Adams, New York, N. Y.**—Pictorial album, atlases, maps, and specimens of printing. T 73 to 78. 306
- 60 American Bible Society, New York.**—Bibles in ancient and modern languages and various bindings. T 73 to 78. 306
- 61 Potter, Ainsworth, & Co., New York, N. Y.**—School books. T 73 to 78. 306
- 62 Griffiths, John W., New York, N. Y.**—Works on ship building. T 73 to 78. 306
- 63 Johnson, T., & J. W., & Co., Philadelphia, Pa.**—American and English law text-books and reports. T 73 to 78. 306
- 64 Peterson, T. B., & Bros., Philadelphia, Pa.**—Books. T 73 to 78. 306
- 65 Stoddart, J. M., & Co., Philadelphia.**—General literature; American edition of the "Encyclopedia Britannica." T 73 to 78. 306
- 66 Rice, D., & Co., Philadelphia, Pa.**—McKenney's Indian Tribes of N. A.; Michaux & Nuttall's American Forest Trees; National Portrait Gallery. T 73 to 78. 306
- 67 Wood, Joseph, Wiscasset, Maine.**—Bound file of "The Seaside Oracle," an American village newspaper. T 73 to 78. 306

Publications, Indian Relics, Scientific and Philosophical Instruments.

- 68 University Publishing Co., New York, N. Y.—School books. T 73 to 78. 306
- 69 Houghton, H. O., & Co., Riverside Press, Cambridge, Mass.—Printing; plain and colored lithographic printing. T 73 to 78. 306
- 70 Masonic Publishing Co., New York, N. Y.—Masonic books and publications. T 73 to 78. 306
- 71 Eldredge & Brother, Philadelphia, Pa.—School books. T 73 to 78. 306
- 72 Scribner, Armstrong, & Co., New York, N. Y.—Books, maps, etc. T 73 to 78. 306
- 73 American Tract Society, New York, N. Y.—Books, tracts, periodicals, wood engravings, teachers' bibles, etc. T 73 to 78. 306
- 74 Sabin, J., & Sons, New York, N. Y.—Dictionary of books relating to America. T 73 to 78. 306
- 75 Leypoldt, F., New York, N. Y.—"Publishers' Weekly," "Trade List Annual," and other trade publications. T 73 to 78. 306
- 76 Kehoe, Lawrence, The Catholic Publication Society, New York, N. Y.—Catholic books of history, devotion, controversy, and general literature. T 73 to 78. 306
- 77 Lindsay & Blakiston, Philadelphia, Pa.—Medical, dental, and scientific books; physicians' visiting list. T 73 to 78. 306
- 78 Kay & Brother, Philadelphia, Pa.—American and English law books. T 73 to 78. 306
- 79 Lee & Shepard, Boston, Mass.—Books. T 73 to 78. 306
- 80 Osgood, James R., & Co., Boston, Mass.—Books. T 73 to 78. 306
- 81 Gill, Wm. F., Boston, Mass.—Books. T 73 to 78. 306
- 82 Seventh Day Adventist Publishing Association, Battle Creek, Mich.—Periodicals, books, and tracts. T 73 to 78. 306
- 83 Knapp, Albert E., Poultney, Vt.—Pictorial family bible and record. T 73 to 78. 306
- 84 American News Co., New York, N. Y.—"American Booksellers' Guide" and "American Bookseller." T 73 to 78. 306
- 85 Miller's Bible & Publishing House, Philadelphia, Pa.—Bound bibles and other books. T 73 to 78. 306
- 86 Dick & Fitzgerald, New York, N. Y.—Dick's Encyclopedia, books of popular information, etc. T 73 to 78. 306
- 87 The Centennial Guide Book Co. (limited), Philadelphia, Pa.—Visitors' Guide to the Centennial Exhibition and Philadelphia. H 72 and N 5. 306
- 88 American Baptist Publication Society, Philadelphia, Pa.—Books and periodicals. T 73 to 78. 306
- 89 Allen, Lane, & Scott and Jas. W. Lauderbach, Philadelphia, Pa.—"A Century After;" picturesque glimpses of Philadelphia and Pennsylvania. T 73 to 78. 306

- 90 Gill, Wm. F., & Co., Boston, Mass.—Monument device of books in the form of Bunker Hill monument. T 75. 306

Institutions and Organizations.

- 91 Burleigh, J. B., Philadelphia, Pa.—Indian relics, illustrating the pre-historic age of the western continent. T 57. 312
- 92 Gabriel, Peter J., Perry, Me.—Implements, ornaments, and utensils used by the Passamaquoddy Indians; weapons, costumes, house implements, and books. P. 65. 312
- 93 State Archæological Association of Ohio.—Relics of pre-historic races and Indians of Ohio. V 61. 312

Scientific and Philosophical Instruments and Methods.

- 94 Kuebler, Wm., Philadelphia, Pa.—Surveyors' and engineers' instruments; mining transit. N 60. 320
- 95 Buff & Berger, Boston, Mass.—Engineers' transits and levels, astronomical transits, mountain theodolite. N 58. 320
- 96 Ritchie, E. S., & Sons, Boston, Mass.—Philosophical and nautical instruments. N 57. 320
- 97 Keuffel & Esser, New York, N. Y.—Drawing instruments, models, and machinery for scientific schools. N 57. 320
- 98 Rodgers, Wm. A., Assistant, Harvard College Observatory, Cambridge, Mass.—Automatic machines for ruling microscopic lines on glass or metals; for grinding and polishing ruling diamonds; for polishing parallel surfaces on glass; for dividing any unit into equal parts; millimetre screw by Froment of Paris, microscope, specimens of diamond and etched rulings on glass, and water motor. N 55. 320
- 99 Clum, H. A., Elmira, New York, N. Y.—Aëliograph or storm writer for predetermining storms. N 60. 320
- 100 Muller's Sons, Nicholas, New York, N. Y.—Thermometers. P 76. 320
- 101 Benjamin, E. B., New York, N. Y.—Geissler tubes and physical apparatus, chemical glass and porcelain wares. N 57. 320
- 102 Carter, A. A., Philadelphia, Pa.—Ellipsograph for describing ellipses. N 57. 320
- 103 Gurley, W., & L. E., Troy, N. Y.—Civil engineers', land surveyors', and mining engineers' instruments and apparatus. N 56. 320
- 104 Lowe, N. M., Boston, Mass.—Terrestrial orrery, graphic hygrometer. N 55. 320
- 105 Prentice, James, New York, N. Y.—Engineers' and surveyors' instruments. N 58. 320
- 106 Heller & Brightley, Philadelphia, Pa.—Surveying, engineering, mathematical, optical, and astronomical instruments. N 59. 320
- 107 Altenecker, Theodore, Philadelphia, Pa.—Joint draughting instruments, protractors, triangles, and drawing scales. N 58. 320

Scientific and Philosophical Instruments, Clocks, Watches.

- 108 Fauth, C., & Co., Washington, D. C.—Astronomic, geodetic, and scientific instruments; equatorial-universal alt-azimuth, theodolites, levels, etc. N 57. 320
- 109 Tarr, Henry S., & Son, Philadelphia, Pa.—Dry level; plumb and level combined. N 57. 320
- 110 Bahmann Bros., New York, N. Y.—Hydrometers, thermometers, and chemical glass instruments. N 58. 320
- 111 Schlotterbeck, A. S., Portland, Me.—Thermometer. N 58. 320
- 112 Tagliabue, Guiseppe, New York, N. Y.—Recording barometer, thermometer, and rain gauge; pyrometers, milk tester, hydrometers. N 58. 320
- 113 Kroedel, Franz, New York, N. Y.—Chorometer for surveying. (*West Gallery.*) 320
- 114 Knox & Shain, Philadelphia, Pa. N 57.
a Engineering instruments. 320
b Telegraph instruments. 326
- 115 Young's, Wm. J., Sons, Philadelphia, Pa. N 59.
a Astronomical circle, equatorial sextant, transits. 320
b Telescopes. 324
- 116 Riggs & Bro., Philadelphia, Pa. N 58.
a Ships' binnacles and logs. 320
b Watchmen's clocks, balance springs for chronometers and watches. 323
- 117 Queen, Jas. W., & Co., Philadelphia, Pa. N 55.
a Mathematical and drawing instruments and accessories for students and professional men. 320
b Microscopes. 324
- 118 Bliss, John, & Co., New York, N. Y. N 52.
a Portable transit implements, ships' logs. 320
b Marine chronometers; parts of chronometers showing stages of manufacture. 323
- 119 Deakin, Robt. T., Philadelphia, Pa. N 56.
a Philosophical instruments, mandrel-drawn tubes. 320
b Green-house syringes; portable fire engine and garden pump. 720
- 120 Watts & Co., Baltimore, Md. N 61.
a Scientific apparatus. 320
b Electrical apparatus. 325
c Telegraphic apparatus. 326
- 121 Stewart, A., Philadelphia, Pa.—Fare controller and indicator; mechanical instruments. N 56. 321
- 122 Darling, Brown, & Sharpe, Providence, R. I.—Rules, try squares, wire gauges, and tools for accurate measurements. P 70. 322
- 123 Eddy, Geo. M., & Co., Brooklyn, N. Y.—Measuring tapes of cotton, linen, and steel. N 57. 322
- 124 Mains Manufacturing Co., New York, N. Y.—Petroleum tester. N 65. 322
- 125 Weaver, Henry M., Mansfield, Ohio.—Automatic balance scales. N 57. 322
- 126 Howard, E., & Co., Boston, Mass.—Clocks. N 66. 323
- 127 Tiffany & Co., New York, N. Y.—Watches. N 41. 323
- 128 Elgin National Watch Co., Elgin, Ill.—Watch movements and materials. P 67. 323
- 129 Seth Thomas Clock Co., Thomaston, Conn.—Clocks. N 65. 323
- 130 Hagstoz & Thorpe, Philadelphia, Pa.—Stiffened gold watch cases. P 43. 323
- 131 American Watch Co., Waltham, Mass.—Watches and watch movements, gold and silver watch cases, watch materials. P 67. 323
- 132 Mehr, Geo., Philadelphia, Pa.—Marble sun dials. (*Outside.*) 323
- 133 Fritz, C. E., Oneonta, N. Y.—Marine chronometer. N 66. 323
- 134 Ithaca Calendar Clock Co., Ithaca, N. Y.—Perpetual calendar clock. N 66. 323
- 135 Reinecke, H., New York, N. Y.—Chronometers, clocks, and horological matter. N 55. 323
- 136 Ansonia Brass and Copper Co., Ansonia, Conn.—Clocks. N 57. 323
- 137 Spellier, Louis H., Doylestown, Pa.—Regulator, with new mode of hanging the pendulum, and anchor pin escapement. N 55. 323
- 138 Empire City Watch Co., Jersey City, N. J.—Watches, watch movements, and watch materials. N 55. 323
- 139 Fasoldt, Charles, Albany, N. Y.—Astronomical tower clock. N 56. 323
- 140 Jerome, S. Bryan, New Haven, Conn.—Clocks. N 56. 323
- 141 Lapp, Ferd., Detroit, Mich.—Carved black walnut clock case. N 56. 323
- 142 Fortenbach & Sons, Carlstadt, N. J.—Silver watch cases. N 58. 323
- 143 Paulus, E., Philadelphia, Pa.—Watches and clocks. N 55. 323
- 144 Hummel, Alois, Baltimore, Md.—Musical clock. N 66. 323
- 145 Robbins, Clark, & Biddle, Philadelphia, Pa.—Watches, clocks. N 43. 323
- 146 Gropengiesser, Jno. L., Philadelphia, Pa.—Astronomical clock. N 56. 323
- 147 Northwestern Tower Clock Co., Milwaukee, Wis.—Tower clock. (*In Northwestern Tower.*) 323
- 148 E. N. Welch Manufacturing Co., Forestville, Conn.—Clocks. N 65. 323
- 149 New Haven Clock Co., New Haven, Conn.—Clocks. N 65. 323
- 150 Imhauser & Co., New York, N. Y.—Watchman's time detector. N 56. 323
- 151 Bacon, B. H., Philadelphia, Pa.—Lunar clock. N 56. 323
- 152 Mitchell, Vance, & Co., New York, N. Y.—Clocks. N 49. 323
- 153 Waterbury Clock Co., Waterbury, Conn.—Pendulum and lever clocks, clock movements. N 63. 323
- 154 Hahl, A., & Co., Baltimore, Md.—Electric clocks, bells, indicators, burglar alarms, tower clocks. N 64. 323
- 155 Wheeler, Marshall, Big Rapids, Mich.—Solar chronometer. N 52. 323
- 156 Schenck, John H., New York, N. Y.—Illuminated clock, "phantasmagoria." N 66. 323
- 157 Hill, J. W., Waterville, Kansas.—Clock, will run 100 years without winding. N 58. 323

Scientific and Philosophical Instruments.

- 158 Willson, T. A., & Co., Reading, Pa.—Steel spectacle and eyeglass frames; lens for optical purposes. N 58. 324
- 159 Zentmayer, Joseph, Philadelphia, Pa.—Microscopes and accessories. N 58. 324
- 160 Bausch & Lomb, Rochester, N. Y.—Optical instruments, lenses, etc. N 55. 324
- 161 Waldstein, H., New York, N. Y.—Optical goods. N 55. 324
- 162 Weiskopf, E., New York, N. Y.—Lenses and pictures for microscopes and magic lanterns; laryngoscopes and ophthalmoscopes; magnifying mirrors. N 57. 324
- 163 Spencer Optical Manufacturing Co., New York, N. Y.—Optical lenses, spectacles, and eyeglasses. N 59. 324
- 164 Edgerton, N. H., Philadelphia, Pa.—Philosophical instruments, stereopticons and slides; self-condensing gas cylinders. N 58. 324
- 165 Diamond, J., Pittsburgh, Pa.—Spectacles and eyeglasses; Russian pebbles. N 56. 324
- 166 Walmsley, W. H., Philadelphia, Pa.—Microscopic preparations. N 55. 324
- 167 American Optical Co., Southbridge, Mass.—Spectacles and eyeglasses. N 57. 324
- 168 Yale Lock Manufacturing Co., Stamford, Conn.—Anodes for nickel-plating. P 72. 325
- 169 Bryan, Jas. C., Philadelphia, Pa.—Magnetic and magneto-electrical lighting rods. N 63. 325
- 170 Reyburn, Hunter, & Co., Philadelphia, Pa.—Lightning rods, points, and fixtures. N 62. 325
- 171 Kidder, Jerome, New York, N. Y.—Electro-medical apparatus. N 56. 325
- 172 Patrick & Carter, Philadelphia, Pa.—Telegraph sounders, learners' apparatus, hotel annunciators, Philadelphia relay, electric bells, and burglar alarms. N 64. 325
- 173 Fleming & Talbot, Philadelphia, Pa.—Electrical instruments and batteries for physicians and surgeons. N 63. 325
- 174 Eiseman, S. M., New York, N. Y.—Self-lighting electric gas burner attachment. N 66. 325
- 175 Cornish, Thos. E., Philadelphia, Pa.—Electric burglar alarm, annunciators, bell calls, clocks, batteries, gongs, wire, etc. N 64. 325
- 176 Rousseau, David, New York, N. Y.—Electric burglar alarm and hotel annunciator. N 65. 325
- 177 Munson, David, Indianapolis, Ind.—Lightning rods. N 59. 325
- 178 Western Electric Manufacturing Co., Chicago, Ill.—Electrical apparatus, electro-physical, medical, and harmonic instruments, annunciators, railway signals, etc. N 60. 325
- 179 Laffin & Rand Powder Co., New York, N. Y.—Electrical blasting apparatus. N 62. 325
- 180 Brittain, R. J., Hedenberg Works, Newark, N. J.—Electro-medical instruments. N 65. 325
- 181 Paoli Belt Co., New York, N. Y.—Electro-voltaic chain belt. N 61. 325
- 182 Galvano-Faradic Manufacturing Co., New York, N. Y.—Electrical instruments for medical use. N 57. 325
- 183 Launert & Decker, Cleveland, Ohio. N 60.
- a* Indicating annunciators and burglar alarm. 325
- b* Alphabetical telegraph instruments. 326
- 184 d'Infreville, Georges, New York, N. Y. N 63.
- a* Hand power magneto-electrical machine, electro-magnetic engine. 325
- b* Quadruplex electric telegraph. 326
- 185 National Fire Alarm Telegraph Co., Richmond, Ind.—System of fire alarm and police telegraph. N 66. 326
- 186 Holmes Burglar Alarm Telegraph Co., New York, N. Y.—Bank vault and safe protector, burglar alarm telegraph, electric hotel and house annunciator, electrical bells. N 64. 326
- 187 Middleton & Thatcher, Newark, N. J.—Automatic burglar alarm. N 64. 326
- 188 Edison, Thos. A., Newark, N. J.—Roman letter, etheric, domestic, automatic, and quadruplex telegraph; electromotograph, doubler, and electric pen. N 63. 326
- 189 Dowden, Geo. A., Newark, N. J.—Burglar alarm and automatic annunciator. N 65. 326
- 190 Henry, D. F., Chief Engineer Water Works, Detroit, Mich.—Model of subaqueous tunnel; telegraphic current meter; flexible jointed water pipe. P 65. 326
- 191 Rice, Jas. D., Philadelphia, Pa.—Lightning rods and points. N 66. 326
- 192 Hall, O. B., & Co., Boston, Mass.—Oral annunciator for hotels. N 65. 326
- 193 Phillips, Eugene F., Providence, R. I.—Flexible tubing; insulated telegraph wire. N 51. 326
- 194 Vigneron, Charles, Providence, R. I.—Piano insulator. N 58. 326
- 195 Welch & Anders, Boston, Mass.—Magneto-printing and dial telegraph instruments; watchman's time recorders. N 61. 326
- 196 Watkins, Wm. B., New York, N. Y.—Automatic fire and burglar telegraph and fire extinguisher; electric thermostats, fire signal boxes, duplex telegraph. N 59. 326
- 197 Western Union Telegraph Co., New York, N. Y.—Telegraphic apparatus. N 63. 326
- 198 Day, Austin G., New York, N. Y.—Kerite insulated telegraph wire and cables; kerite battery cups; electrical battery. N 63. 326
- 199 White, Samuel S., Philadelphia, Pa., and Gray, Elisha, Chicago, Ill.—Electro-harmonic telegraph. N 65. 326
- 200 Coston, Wm. F., Philadelphia, Pa.—Application of Coston night signal, to the International and N. Y. Yacht Club codes. H 68. 326
- 201 Coston, Martha J., Philadelphia, Pa.—Telegraphic night signal for use on land and sea. H 68. 326

Musical Instruments.

- 202 Hale, B. S., & Co., Lawrence, Mass.—Electric wire. N 75. 326
- 203 Otto, John William, St. Louis, Mo.—Piano. P 60. 327
- 204 Pfaff, John, Philadelphia, Pa.—Clarionets, ivory flute, tail piece for violin, tuning pipe. P 66. 327
- 205 Baker, Calvin, Weymouth, Mass.—Violins. P 66. 327
- 206 Pratt, Read, & Co., Deep River, Conn.—Ivory combs, piano forte and organ keys, ivory veneers, and other ivory goods. P 63. 327
- 207 Burdett Organ Co., Erie, Pa.—Burdett organs. P 64. 327
- 208 Meyer, Conrad, & Sons, Philadelphia, Pa.—Square piano fortes, original iron-plate frame piano, Conrad Meyer inventor, 1833. P 65. 327
- 209 Schomacker Piano Co., Philadelphia, Pa.—Square and concert grand, square, and upright pianos. N 67. 327
- 210 Hallet, Davis, & Co., Boston, Mass.—Orchestral, concert, and parlor grand, upright, and square grand pianos. N 61. 327
- 211 Miller, Henry F., Boston, Mass.—Piano fortes. N 65. 327
- 212 Rosewig, A. H., Philadelphia, Pa.—Piano fortes. P 62. 327
- 213 Albert, Chas. F., Philadelphia, Pa.—String quartet, violins, chin and cello rests, wrapped strings, guitars, a Stradivarius and a Guarnerius violin. P 62. 327
- 214 Mason & Hamlin Organ Co., Boston, Mass.—Cabinet organs. P 66. 327
- 215 Albert, John, Philadelphia, Pa.—String quintet, violins made by Albert's machine. P 62 and 63. 327
- 216 Seefeldt, Wm. F., Philadelphia, Pa.—Brass and German silver musical instruments. P 59 and 63. 327
- 217 Faas, Anthony J., jr., Philadelphia, Pa.—Accordeon concerto. P 62. 327
- 218 Estey, J., & Co., Brattleboro', Vt.—Organs. P 63. 327
- 219 Dolge, Alfred, New York, N. Y.—Piano forte and polishing felts; spruce sounding-board material. P 66. 327
- 220 Faas, Anthony, Philadelphia, Pa.—Pianos. P 64. 327
- 221 Waters, Horace, & Sons, New York, N. Y.—Organs. P 64. 327
- 222 Roosevelt, H. L., New York, N. Y.—Organs, hydraulic engines, and other blowing apparatus. (*North gallery.*) 327
- 223 Schwarzer, Franz, Washington, Mo.—Cithers. P 59. 327
- 224 Hazleton Bros., New York, N. Y.—Grand, cabinet grand, upright, and square pianos. N 64. 327
- 225 Albrecht & Co., Philadelphia, Pa.—Grand, upright, and square pianos. P 68. 327
- 226 Woods, Geo., & Co., Cambridgeport, Mass.—Organs. P 61. 327
- 227 Gemunder, Geo., Astoria, N. Y.—Stradivarius quartet, one Stradivarius, and one Guarnerius violin. P 61. 327
- 228 Dürner, Chas. F., Quakertown, Pa.—Church organ. P 61. 327
- 229 Shoninger, B., Organ Co., New Haven, Conn.—Reed organs. N 68. 327
- 230 Steinway & Sons, New York, N. Y.—Grand, upright, and square piano fortes. P 66. 327
- 231 Decker Bros., New York, N. Y.—Concert and parlor grand, upright, and square piano fortes. P 67. 327
- 232 Lehnert, Henry G., Philadelphia, Pa.—Improved brass instruments, for bands and orchestras. P 59. 327
- 233 Goldsmith, Jonas G., New York, N. Y.—Square piano forte. P 62. 327
- 234 Bacon & Karr, New York, N. Y.—Square and upright pianos. P 62. 327
- 235 Neff, Joseph, Philadelphia, Pa.—Quartette of musical string instruments. P 62. 327
- 236 United Piano Makers, Brooklyn, N. Y.—Grand, upright, and square pianos. P 64. 327
- 237 Heppe, C. J., Philadelphia, Pa.—Grand, square, and upright pianos, and parlor organs. P 64. 327
- 238 Manhattan Piano Forte Co., New York, N. Y.—Piano fortes. P 63. 327
- 239 Emerson Piano Co., Boston, Mass.—Upright and square pianos. P 63. 327
- 240 Tschantz, A. J., Orrville, Ohio.—Parlor organs. P 62. 327
- 241 Quaker City Organ Co., Philadelphia, Pa.—Cabinet organs. P 63. 327
- 242 McCammon, Wm. M., Albany, N. Y.—Piano fortes. P 63. 327
- 243 Peloubet, Pelton, & Co., New York, N. Y.—Reed organs. P 65. 327
- 244 Benham Organ Co., Indianapolis, Ind.—Cabinet organs. P 62. 327
- 245 Nicholls, Reuben, Philadelphia, Pa.—Church organ, with pneumatic action. P 66. 327
- 246 Richardson & Lehnert, Boston, Mass.—Cymbals and gongs, Turkish and Chinese combination of metals. P 59. 327
- 247 Ohio Valley Piano Co., Ripley, Ohio.—Pianos. P 63. 327
- 248 Cummins Henry, New York, N. Y.—Violin. P 62. 327
- 249 Buttkerit, Carl G., Des Moines, Iowa.—Upright bell piano. P 59. 327
- 250 Georgi, George A., Jamestown, N. Y.—Piano fortes. P 64. 327
- 251 Hinds & Sons, Newark, N. J.—Piano fortes. N 63. 327
- 252 Wing, F. L., & Hill, F. M., New York, N. Y.—Dolce piano forte, without strings; organ. T 59. 327
- 253 McFadden, George, Syracuse, N. Y.—Cornets and trombones. P 63. 327
- 254 Moeller, A., Hartford, Conn.—Upright piano. P 63. 327
- 255 Simpson & Co., New York, N. Y.—Square and upright piano fortes. P 64. 327
- 256 Gemunder, August, New York, N. Y.—Four stringed double bass. P 59. 327
- 257 Sohmer & Co., New York, N. Y.—Upright and square piano fortes. P 62. 327

Musical Instruments, Engineering Models and Plans.

- 258 McDonald, Jas., Williamsport, Pa.—Square grand piano fortes. P 63. 327
- 259 Dobson, Mrs. Louisa, New York, N. Y.—Banjo. P 65. 327
- 260 Haines Bros., New York, N. Y.—Grand, square, and upright piano fortes. P 62. 327
- 261 Steck, George, & Co., New York, N. Y.—Grand, square, and upright pianos. N 60. 327
- 262 Hardman, Hugh, New York, N. Y.—Grand, square, and upright piano fortes. N 62. 327
- 263 Weber, Albert, New York, N. Y.—Concert and parlor grand, upright, and square pianos. N 66. 327
- 264 Wildman, L. P., Danbury, Conn.—Violins. P 59. 327
- 265 United States Piano Co., New York, N. Y.—Piano forte. P 62. 327
- 266 Knabe, Wm., & Co., Baltimore, Md.—Grand, square, and upright pianos; a harpsichord made by Tschudi & Broadwood, for Chas. Carroll, of Carrollton. P 60 and 61. 327
- 267 Berry, James B., Boston, Mass.—Square and grand piano fortes. P 62. 327
- 268 Stieff, Chas. M., Baltimore, Md.—Grand, square, and upright pianos. N 64. 327
- 269 New Haven Organ Co., New Haven, Conn.—Organs. P 64. 327
- 270 Hook, E., & G. G., & Hastings, Boston, Mass.—Grand concert, chapel, and church organs. (*East Gallery.*) 327
- 271 Gamage, Arnold, Boston, Mass.—Parlor grand piano forte. P 66. 327
- 272 Ryder, George H., & Co., Boston, Mass.—Organs. P 59. 327
- 273 Symonds, S. C., Boston, Mass.—Metal organ pipes. P 63. 327
- 274 Perry, J. R., Wilkesbarre, Pa.—Organs; testing and toning box for reed organs. P 64. 327
- 275 Rogers Upright Piano Co., Boston, Mass.—Upright pianos. P 65. 327
- 276 Perrot, Auguste, Philadelphia, Pa.—Tonognome, a portable melodcon. P 59. 327
- 277 Musical Instrument Manufacturing Co., Scranton, Pa.—Pianos, violins, guitars, etc. P 61. 327
- 278 Chickering & Sons, Boston, Mass.—Piano fortes. P 61. 327
- 279 Wellenberger, Jos., & Ganter, New York, N. Y.—Orchestrion or self-acting organ. P 65. 327
- 280 Mortimer, John R., New York, N. Y.—Pneumatic exhaust palate for organs. P 60. 327
- 281 Behning & Diehl, New York, N. Y.—Grand square pianos. N 63. 327
- 282 Central Piano Forte Co., New York, N. Y.—Square piano. N 63. 327
- 283 Mathushek Piano Co., New Haven, Conn.—Pianos. P 59. 327
- 284 Smith, B. N., & Co., New York, N. Y.—Carved piano legs and lyres. P 59. 327
- 285 Secor, Jerome B., Bridgeport, Conn.—Automaton singing birds in cages and vases. T 48. 327
- 286 Kranich & Bach, New York, N. Y.—Grand, upright, and square piano fortes. N 63. 327
- 287 Clough & Warren Organ Co., Detroit, Mich.—Parlor organ. P 59. 327
- 288 Missenharter, Chas., New York, N. Y.—Excelsior musical instruments. P 59. 327
- 289 Kompff, Ph., New York, N. Y.—Military drums, banjos, and tambourines. P 62. 327
- 290 Lighte & Ernst, New York, N. Y.—Grand square piano fortes. P 65. 327
- 291 Willis, Aug. L., Philadelphia, Pa.—Octave coupler for piano fortes. H 71. 327
- 292 Browne & Buckwell, New York, N. Y.—Grand concert double action harp and music desk. P 63. 327
- 293 Conn & Dupont, Elkhart, Ind.—Musical instruments for bands; improved mouthpieces for band instruments. P 59. 327
- 294 Boston Musical Instrument Manufactory, Boston, Mass.—Brass band musical instruments. P 64. 327
- 295 Schindler, C. A., New York, N. Y.—Piano stools. P 62. 327
- 296 Taylor & Farley Organ Co., Worcester, Mass.—Cabinet and church reed organs. P 68. 327
- Engineering, Architecture, Charts, Maps, and Graphic Representations.**
- 297 Lowthorp, Francis C., Trenton, N. J.—Photographs of iron bridges erected, plans of wrought iron bridge and turn tables. T 67. 330
- 298 American Bridge Co., Chicago, Ill.—Model of rigid suspension bridge, details of construction, photographs and drawings. T 67. 330
- 299 Clarke, Reeves, & Co., Phoenixville Bridge Works, Philadelphia, Pa.—Photographs and models of bridges, viaducts, and other iron structures actually executed. (*West Gallery.*) 330
- 300 Pettit, Henry, & Wilson, Jos. M., Engineers and Architects, Philadelphia, Pa.—The Main Exhibition building, Machinery Hall and adjacent boiler houses for the International Exhibition, 1876. (*In Park.*) 330
- 301 King Iron Bridge and Manufacturing Co., Cleveland, Ohio.—Wrought iron highway bridge between Horticultural Hall and Art Gallery. 330
- 302 Pearsons, G. W., Ogdensburg, N. Y.—Model of a standpipe. (*West Gallery.*) 330
- 303 Pettit, Henry, Philadelphia, Pa.—Bridges and bridge construction. (*West Gallery.*) 330
- 304 Wilson, Jos. M., Philadelphia, Pa.—Bridge and bridge construction. (*West Gallery.*) 330
- 305 Centennial Commission of the American Society of Civil Engineers, Pa.—Papers, drawings, photographs, and models of engineering in America. (*West Gallery.*) 330
- 306 Chanute, Octave, New York, N. Y.—Engineering exhibits relating to bridges and bridge construction. (*West Gallery.*) 330

Engineering Plans, Physical and Moral Condition of Man.

- 307 Croes, J. James R., Yonkers, N. Y.—Engineering exhibits relating to water works. (*West Gallery*.) 330
- 308 Herring, Rudolph, Philadelphia, Pa.—Plans of bridges, with photographs showing progress; section of sewers of Philadelphia. (*West Gallery*.) 330
- 309 Chester, Stephen, New York, N. Y.—Exhibit relating to electrical engineering. (*West Gallery*.) 330
- 310 Larvelle, J. H., Philadelphia, Pa.—Bridges and bridge construction. (*West Gallery*.) 330
- 311 Clark, Reeves, & Co., Philadelphia, Pa.—Bridges and bridge construction. (*West Gallery*.) 330
- 312 Rockwood, Geo. F., New York, N. Y.—Photographs showing successive stages of engineering construction. (*West Gallery*.) 330
- 313 Crezier, D. W. C., Chicago, Ill.—Model of hydrant and stopcock. (*West Gallery*.) 330
- 314 Jarvis, John B., Rome, N. Y.—Engineering drawings, relating to construction of canals; Carbondale railroad and Croton aqueduct. (*West Gallery*.) 330
- 315 Foster, Wilbur F., Nashville, Tenn.—Model of Howe truss bridge. (*West Gallery*.) 330
- 316 Armington, James H., Brooklyn, N. Y.—Exhibit relating to gas engineering. (*West Gallery*.) 330
- 317 Thurston, Robert M., Hoboken, N. J.—Exhibit relating to mechanical engineering. (*West Gallery*.) 330
- 318 Ellis, Theo. G., Hartford, Conn.—Engineering exhibit relating to river and harbor improvement. (*West Gallery*.) 330
- 319 McAlpine, Wm. J., Albany, N. Y.—Engineering exhibits relating to canals and inland navigation. (*West Gallery*.) 330
- 320 Emery, Chas. E., New York, N. Y.—Engineering exhibits relating to hydraulic motors and machines. (*West Gallery*.) 330
- 321 Smith, Wm. Sooy, Maywood, Ill.—Engineering exhibit relating to foundations and masonry. (*West Gallery*.) 330
- 322 Shedd, J. Herbert, Providence, R. I.—Engineering exhibits relating to sewerage and sanitary purposes. (*West Gallery*.) 330
- 323 Briggs, Robert, Philadelphia, Pa.—Exhibits relating to steam engineering. (*West Gallery*.) 331
- 324 Shinn, Wm. P., Pittsburgh, Pa.—Engineering exhibit relating to railroads and rolling stock. (*West Gallery*.) 332
- 325 Hanging Rock Iron Region.—Geological map of Kentucky's portion of the Hanging Rock iron region. T 68. 335
- 326 Hanging Rock Iron Region, Iron-ton, Ohio.—Geological map of Ohio's portion of the Hanging Rock iron region. T 68. 335
- 327 Earnshaw, Henry, Cincinnati, Ohio.—Photographs of parks and cemetery. (*West Gallery*.) 335
- 328 Cleveland, H. W. S., Chicago, Ill.—Design (adopted) for improvement of South Park, Chicago. (*West Gallery*.) 335
- 329 Bowditch, Ernest W., Boston, Mass.—Plans of proposed chain of parks for Boston; a cemetery, and a country estate. (*West Gallery*.) 335
- 330 Krause, H., New York, N. Y.—Topographical maps. (*West Gallery*.) 335
- 331 Sibeth, Otto, New York, N. Y.—Construction map New York Central Park. (*West Gallery*.) 335
- 332 Walling, H. T., Boston, Mass.—Topographical maps and atlases. (*West Gallery*.) 335
- 333 Bogart, John, New York, N. Y.—Engineering exhibit relating to park work, surveying, and geodesy. (*West Gallery*.) 335
- Physical, Social, and Moral Condition of Man.**
- 334 Health Lift Co., New York, N. Y.—Reactionary lift apparatus. N 52. 340
- 335 Shibe, J. D., Philadelphia, Pa.—Base balls. B 77. 340
- 336 Reach & Johnston, Philadelphia, Pa.—Base balls and sporting goods. B 75. 340
- 337 Marsh, Jas. P., & Co., Chicago, Ill.—Improved health lift. N 52. 340
- 338 Rice, S. W., & Co., New York, N. Y.—Base and dead balls, uniforms, and sporting goods. B 75. 340
- 339 Hiester, Chas. Edward, Harrisburg, Pa.—Exercising clubs of adjustable weight. N 50. 340
- 340 Leeds, Louis M., New York, N. Y.—Diagrams and charts on ventilation. B 78. 342
- 341 Derrom, Andrew, Passaic, N. J.—Workman's cottage. (*In Park*.) 342
- 342 Kasson, W. M., Department of Public Comfort. (*North, South, and West Entrances*.) 342
- 343 Department of Public Comfort.—Stationery, newspapers, periodicals, and photographs for sale. H 70 and N 6. 342
- 344 Rudolph & Walter, Camden, N. J.—Buffet. T 41 to 47. 342
- 345 Department of Public Comfort.—Café, Leland's. T 33 to 36. 342
- 346 American Missionary Association, New York, N. Y.—Map, showing location of institutions and mission stations in the United States, photographs of buildings, examination papers, catalogues. (*South Gallery*.) 348
- 347 Centennial Safe Deposit Co., Philadelphia, Pa.—Safes for the protection of valuables. N 65. 343
- 348 Scott, J. W., & Co., New York, N. Y.—Foreign stamp albums. P 73. 344
- 349 Boyle, John, New York, N. Y.—Mail bags, sacks, and lock pouches. C 78. 345
- 350 Inventors' Protective and Benevolent Association of the United States, Pittsburgh, Pa.—Working models of inventions of members of the association. (*West Gallery*.) 346
- 351 Young Mens' Christian Association of North America, Executive Committee, Richard C. Morse, Secretary, New York, N. Y.—Map, pictures, and plans of association buildings; reports, circulars, and other literature. (*South Gallery*.) 348

Architectural, Engineering Designs, etc.

- 352 Heard & Sons, Cleveland, Ohio.—
Architectural design of the Ohio State
Building. 441
- 353 Pfeiffer, Carl, New York, N. Y.—
Design of New Jersey State Build-
ing. 441
- 354 Schwarzmamm, H. J., Philadelphia,
Pa.—Designs of Memorial Hall, Horticul-
tural Hall, Judges' Pavilion, and Women's
Pavilion. 441
- 355 Spurr, Chas. W., Boston, Mass.—
Wood hangings and marquetry. P 73. 452
- 356 Stokes & Parrish, Philadelphia,
Pa.—Passenger elevator. (*S. E. Central
Tower.*) 563
- 357 Boston Hydraulic Motor Co.,
Boston, Mass.—Hydraulic motors for
blowing Hook & Hastings' organ in gallery
at east end of Nave. L 79 and K 79. 563
- 358 Byrns & Bryan, New York, N. Y.
—Ale pump. P 59. 565
- 359 Pullman's Palace Car Co., Chi-
cago, Ill.—Gold and silver model of a Pull-
man palace sleeping car. N 63. 571
- 360 Woodruff, Jonah, Philadelphia,
Pa.—Silver model of sleeping car. N
61. 571
- 361 Snow, J. H., Bucksport, Me.—
Model ship. H 70. 594
- 362 American Steamship Co., Phila-
delphia, Pa.—Models and paintings of
the company's steamships. N 63. 595
- 363 State of New Jersey (by Geo. H.
Cook, State geologist, New Brunswick,
N. J.).—Specimens of wood growing in
New Jersey. T 70. 600
- 364 Philadelphia & Reading R. R. Co.,
Philadelphia, Pa.—Cereals. T 72. 620
- 365 State of New Jersey (by Geo. H.
Cook, State geologist, New Brunswick,
N. J.).—Fertilizers and soils. T 70. 681

GREAT BRITAIN.

(North of Nave, Columns 23 to 38.)

Educational Books and Appliances, Scientific Instruments.

Educational Systems, Methods, and Libraries.

- 1 Sunday-school Union, London.—Works for Sunday-schools.—Books, magazines, cards, reward tickets, illuminations, and large type texts, Sunday-school registers, roll books, librarian and minute books; Sunday-school newspaper. 300
- 2 Beckhoffer, Eugene, Ravenswood, Bournemouth.—Specimen of calligraphy. 300
- 3 Bartholomew, John, Edinburgh.—Maps. 300
- 4 Ravenstein, Ernest George, Geographical Institute, London.—General and geological maps of New Zealand; physical and statistical atlas of United Kingdom; relief map of the United States; geographical and statistical works. 300
- 5 Johnston, W. & A. K., Edinburgh, Scotland.—Maps; illustrations of human anatomy, astronomy, botany, and mechanical powers. 300
- 6 Smith, C., & Son, London.—Maps and globes. 300
- 7 Adams, Walter Marsham, London.—The problem of Pythagoras; coelometer for illustrating elementary astronomy; mensurator for solving triangles, etc. 302
- 8 Augener, George, & Co., London.—Editions of the classics and other printed music books. 302
- 9 Clark, Edward Podmore, Bath.—Military model apparatus for illustrating drill movements. 302
- 10 The British and Foreign Blind Association, for Promoting the Education and Employment of the Blind, London.—Writing frames, embossed books, and maps for the blind. 303
- 11 Dickinson & Higham, London.—The hexaglot bible. 306
- 12 Dickes, William, London.—Chromo-lithography, engraving and photographic engraving and printing; framed oleographs, chromographs from stone and surface printing, wood engraving, photographic engraving, etc. 306
- 13 Scott, Robson John, London.—Blocks used for wood engravings; compound and bolted blocks of box and other woods. 306
- 14 Stephenson, Blake, & Co., Sheffield.—Specimens of printing, types, book of specimens. 306
- 15 Johnson, Edmund, London.—Catalogues and other works having reference to international exhibitions. 306
- 16 Palmer, Samuel, London.—Index to the Times newspaper, a quarterly publication. 306
- 17 Loth, John Thomas, Edinburgh.—Educational books and illustrations of the thirty-three degrees of the ancient and accepted Scottish rite. 306
- 18 Lockwood, Crosby, & Co., London.—Books, rudimentary, scientific, educational, and classical series. 306
- 19 Cassell, Petter, & Galpin, London.—Illustrated books, publications, serials; educational books and appliances; electrotypes of engravings on wood. 306
- 20 Smith, David, Halifax, Yorkshire.—The "Dyer's Instructor." 306
- 21 Dowson, Sutherland, & Co. (limited), London.—Complete file of "Iron," a weekly newspaper. 306
- 22 Potts, Roberts, Trinity College, Cambridge.—Educational books. 306
- 23 Murray, Andrew, London.—Illustrations and specimens of galls produced by mites, aphides, flies (cecidomyia), sand-flies, cymipidæ. 306
- 24 Proprietors of the "Illustrated London News," London.—Specimens illustrating the art department of the Illustrated London News. 306
- 25 Rola, Vincent, Bayswater.—Method for the piano, with diagrams and specimens of music. 306
- 26 Proprietors of the "Graphic," London.—Process of producing an illustrated newspaper, from the receipt of sketches to the final issue of printed sheets to the public. 306
- 27 Holdsworth, Edmund William Hunt, London.—Work on deep sea fishing and fishing boats. 306
- 28 Johnson, J. M., & Sons (limited), London.—Printing in color, show tablets. 306
- 29 Day & Son, London.—Chromo-lithography. 306
- 30 Rundell, Joseph Benjamin, South Kensington Museum, London.—Shorthand alphabet; maps, plans, etc., for educational atlases and other purposes; lithographic printing as applied to maps. 306
- 31 Paul, William, Waltham Cross, Herts.—Works on horticulture. 306

Scientific Instruments.

- 32 Siemens, Charles William, London.—Pyrometers. (*In Machinery Hall.*) 320
- 33 Lyon, Washington, London.—Calculating table for rapidly multiplying numbers above 12. 321

Watches, Scientific and Musical Instruments.

- 34 Wier, M. A., & Co., London.—Hydro-gyrometer or revolution indicator. 321
- 35 Morton, George, London.—Chronometer and watch balance springs, wire, and gauge. 322
- 36 Smith, Borthwick, London.—Watches and chronometers, cases, dials, and movements; rink and parlor skates; tools and machinery for watch manufacture. 323
- 37 Sewill, J., Liverpool.—Marine chronometers and watches. 323
- 38 Mercer, Thomas, London.—Marine chronometers. 323
- 39 Kullberg, Victor, London.—Marine chronometers, watches, chronographs, repeaters, etc. 323
- 40 Dent, M. F., London.—Marine chronometers, watches, chronometer clocks, etc. 323
- 41 Whittaker, Richard, London.—Keyless watches. 323
- 42 Poole, James, & Co., London.—Marine chronometers and watches. 323
- 43 Nicole, Nielsen, & Co., London.—Watches, chronometers, complicated watches, and chronographs. 323
- 44 Claxton, Robert, London.—Chronometer jewelings in all stages. 323
- 45 Frodsham, Charles, & Co., London.—Watches, clocks, and chronometers for astronomical purposes; pocket and marine chronometers. 323
- 46 Swift, James, London.—Microscopes and apparatus. 324
- 47 Middleton, Thomas John, London.—Magic lanterns, dissolving view apparatus, dissolving top for the oxyhydrogen lime light, lantern slides, etc. 324
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- 49 Wheeler, Edmund, London.—Specimens for the microscope. 324
- 50 Dallmeyer, John Henry, London.—Astronomical and terrestrial telescopes, microscopes, photographic lenses, cameras, and apparatus. 324
- 51 Ross & Co., London.—Microscopes, monocular and binocular apparatus, object glasses, telescopes, and photographic lenses. 324
- 52 Crouch, Henry, London.—Microscopes, binocular, and with complete accessories for every class of scientific investigation; cabinets, lamps. 324
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- 59 Collmann, Leonard W., London.—Cottage piano. 327
- 60 Besson, F., & Co., London.—Brass musical instruments. 327
- 61 Browne, H. Justin, London.—Upright cottage piano fortes. 327
- 62 Rudell, Carte, & Co., London.—Gold, ebonite, cocoa wood, and silver cylinder flutes. 327
- 63 Cochrane, Robert C. E., Athlone, Ireland.—Drawings illustrating the application of concrete to the erection of an improved construction of dwellings. 344

NEW SOUTH WALES.

(North of Nave, Columns 10 to 17.)

Educational and Statistical Publications, Photography, etc.

Educational Systems, Methods, and Libraries.

- 1 Mechanics' School of Arts, Sydney.—Wax seal impression of corporate seal. 302
- 2 Government Printing Office, Sydney, New South Wales.
 - a Meteorological results, and report on education. 305
 - b Government gazettes, statutes, statute index, specifications of patents, parliamentary hand book, blue book and statistical register, census, reports on railways, Rae's poems, newspapers, Australian languages. 306

Institutions and Organizations.

- 3 New South Wales Commissioners, Sydney.—Birds of Australia, prepared by Thorpe. 312
- 4 Trustees of the Australian Museum, Sydney.—Specimens of natural history of Australia. 312

Scientific and Philosophical Instruments and Methods.

- 5 Parrot, T. S., Sydney.—Sematope, an instrument designed for army signaling purposes. 326

Engineering, Architecture, Maps, etc.

- 6 New South Wales Commissioners, Sydney.—Topographical and geological maps and sections of New South Wales. 335

Physical, Social, and Moral Condition of Man.

- 7 Government Printing Office, Sydney.—Industrial progress of New South Wales; transactions of Royal Society. 347

Photography.

- 1 The Commission.—Photographic views of public buildings, scenery, etc., in and around Sydney, N. S. W. 430
- 2 Richards, T., Sydney. 430
 - a Photographic views of buildings, etc., in and around Sydney.
 - b Photographic views of Blue Mountains and valley of the Grose.
 - c Photographic views of entomological collection of New South Wales.
- 3 Degotardi, John, Sydney.—Photo-mechanical printing. 431
- 4 Richards, T., Sydney.—Photo-lithographs. 432

Hydraulic and Pneumatic Apparatus.

- 1 Postle, Sydney.—Ice machine. 568

VICTORIA.

(North of Nave, Columns 10 to 17.)

Educational Works and Statistics, Musical Instruments.

Educational Systems, Methods, and Libraries.

- 1 Educational Department of Victoria, Melbourne.—Photographic views of state schools in Victoria. 300
- 2 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Portfolios of music by W. H. Glen. 302
- 3 Victorian Asylum and School for the Blind, Melbourne.—Baskets, perambulators, portmanteaus, trunks, mats, fancy wool-work, etc., made by the pupils. 303
- 4 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Official records, catalogues, lectures, reports, medical works, school books, sermons, and general literature.

- 5 Ferres, John, Government Printer, Melbourne.—Reports and statistics from the principal government institutions of Melbourne; Victorian newspapers. 305
- 6 Warrnambool, Borough Council for Warrnambool.—Statistics of the borough. 305

Scientific and Philosophical Instruments and Methods.

- 7 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Bell and stand. 327
- 8 Kilner, Joseph, Richmond.—Piano fortes. 327

Engineering, Physical and Social Condition of Man.

Engineering, Architecture, Maps, etc.

- 9 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.—Miscellaneous maps, etc. 330
- 10 Surveyor-General of Victoria, Melbourne.—Maps and plans of the colony of Victoria. 330

Physical, Social, and Moral Condition of Man.

- 11 Commissioners for Victoria, for the Philadelphia Exhibition, Melbourne.
- α Patent ceiling ventilator, model of Victorian bush residence, with huts and various kinds of fencing. 342
- β Sovereigns and half-sovereigns from Royal Victorian mint, Melbourne. 344

- γ Baskets, mats, etc., made at Coranderk aboriginal mission station; vocabulary of Victorian aboriginal dialects, bluestone tomahawk, photographs of Victorian aborigines. 347
- δ Victorian and English ensigns. 349
- 12 Bank of Victoria, Melbourne.—Bank notes and statistics of the bank. 344
- 13 Commercial Bank of Australia, Melbourne.—Bank notes, photographs, and statistics of the bank. 344
- 14 National Bank of Australasia, Melbourne.—Bank notes and statistics of the bank. 344
- 15 Penal Department, Inspector-General of Melbourne.—Warder's uniform, prisoners' clothing, hats, boots, shoes, mats, etc. 345

CANADA.

(North of Nave, Columns 16 to 23.)

Educational Systems, Works, and Appliances.

Educational Systems, Methods, and Libraries.

- 1 Merritt, J. P., St. Catherine's, Ont.—Metric and chronological tables, chronotable of Canada. 300
- 2 Tennant & McLachlan, Hamilton, Ont.—Penmanship. 300
- 3 Pearse, James, Chatham, Ont.—Penmanship. 300
- 4 Browne, James, Toronto, Ont.—Chart stand and illustrator. 300
- 5 Crooks, A., Toronto, Ont.—Educational department of Ontario. 300
- 6 Beatty, L. J., Belleville, Ont.—Penmanship. 300
- 7 Hector, Thos., Ottawa, Ont.—Rotary polar map of the world. 300
- 8 Genest, P. M. A., Quebec, Q.—Map of "La Nouvelle France." 300
- 9 Tackabury, J. N., Montreal, Q.—Dominion atlas, maps of Ontario and Quebec. 300
- 10 Leroy, P., Quebec, Q.—System of education. 300
- 11 Baillarge, Ch., Quebec, Q.—Stereometrical tableau. 300
- 12 English, Ch., St. John, N. B.—Composition blackboard. 300
- 13 Hill, C. P., Halifax, N. S.—Photograph Halifax Industrial School. 300
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- 15 McGill University, Montreal, Q.—Calendars, medals, photographs of universities. 301
- 16 Universite Laval, Quebec, Q. 303
- 17 College Nicolet, Nicolet, Q. 303
- 18 Maitrise St. Pierre, Montreal, Q. 303
- 19 Ecole du Plateau, Montreal, Q. 303
- 20 College St. Hyacinthe, St. Hyacinthe, Q. 303
- 21 Seminaire Ste. Thérèse, Ste. Thérèse, Q. 303
- 22 College Joliette, Joliette, Q. 303
- 23 Seminaire de Remouski, Remouski, Q. 303
- 24 Ursulines, Quebec, Q. 303
- 25 Ursulines, Trois-Rivières, Q. 303
- 26 Convent Hochelaga, Hochelaga, Q. 303
- 27 Convent Longueuil, Longueuil, Q. 303
- 28 Académie des S. S. Anges, Montreal, Q. 303
- 29 Providence, Montreal, Q. 303
- 30 Bon Pasteur, Montreal, Q. 303
- 31 Hotel Dieu, Montreal, Q. 303
- 32 Hotel Dieu, Quebec, Q. 303
- 33 Hopital Général, Quebec, Q. 303
- 34 Hopital Général, Montreal, Q. 303
- 35 Frères de la Charité, Montreal, Q. 303
- 36 Hopital du Sacré-Cœur, Montreal, Q. 303
- 37 Convent de Bellevue, Quebec, Q. 303
- 38 Convent de St. Joseph, Quebec, Q. 303
- 39 Convent de Sillery, Quebec, Q. 303
- 40 Campbell, James, Toronto, Ont.—Books. 306
- 41 Weld, W., London, Ont.—Farmer's Advocate. 306
- 42 Lovel Printing and Publishing Co., Montreal, Q.—School and other books. 306
- 43 Webster, Geo., Hamilton, Ont.—Bible, printed. 306

Indian Work, Scientific and Musical Instruments, Engineering.

- 44 Sheppard, W., Quebec, Q.—Bible (1555). 306
 45 MacKenlay, A. & W., & Co., Halifax, N. S.—Map of the United States, series of school books. 306

Institutions and Organizations.

- 46 Bell, Robert, Montreal, Q.—Indian curiosities and manufactures. 312
 47 St. Amand, A., Lorette, Q.—Indian curiosities. 312
 48 Advisory Board, Victoria, Br. Col.—Indian goods and manufactures. 312

Scientific and Philosophical Instruments and Methods.

- 49 Cornell, S., Widden Station, Ont.—Marine compass. 320
 50 Albert Meyer, F. W., Montreal, Q.—Apparatus for determining inaccurate points. 320
 51 Hearn & Harrison, Montreal, Q.—Surveying and other instruments. 320
 52 Ross, Alex., Montreal, Q.
 a Odometer. 320
 b Indicating and registering apparatus. 321
 53 Landham, F., Ottawa, Ont.—Lumbermen's measuring rule. 322
 54 Sabis, B., Point Levis, Q.—Sliding foot rule. 322
 55 Selwreck, Simon, Barrie, Ont.—Timepiece. 323
 56 Morris, J. W., Hamilton, O.—Universal clock. 323
 57 Duquet, C., Quebec, Q.—Watchman detector. 323
 58 Lefort & Chapleau, Montreal, Q.—Watchman detector. 323
 59 Woodward, H., Toronto, Ont.—Electric light machine. 324
 60 Electric and Hardware Manufacturing Co., Toronto, Ont.—Electric telegraph apparatus. 326
 61 Brunelle & Mohr, Quebec, Q.—Gravity battery. 326
 62 Morrin Bros., Parkhill, Ont.—Parlor organ. 327
 63 Bell, W., & Co., Guelph, Ont.—Cabinet organs. 327
 64 Uxbridge Organ Co., Uxbridge, Ont.—Organs. 327
 65 Lamère, J. H. D., Toronto, Ont.—Organs. 327
 66 Mee, C., & Co., Kingston, Ont.—Mélodeon, parlor organ, and organ keys. 327
 67 Mudge & Yarwood Manufacturing Co., Whitby, Ont.—Harmonium, mélodeon, rumpers, and bellows for organ. 327
 68 Dominion Organ Co., Bowmanville, Ont.—Organs. 327

- 69 Thomas, C. L., & Co., Hamilton, Ont.—Piano. 327
 70 Knot, John, & Son, Hamilton, Ont.—Upright piano. 327
 71 Heintzman & Co., Toronto, Ont.—Square piano. 327
 72 Kater, Th., Hamilton, Ont.—Pianos, parts of pianos, etc. 327
 73 Weber & Co., Kingston, Ont.—Pianos. 327
 74 Rainer & Son, Guelph, Ont.—Piano. 327
 75 Draper, E., London, Ont.—Harmonic instructor and musical game. 327
 76 Smith Organ Co., Brome, Q.—Organs. 327
 77 Lyonnais, T., Quebec, Q.—Violin. 327
 78 Brown, Edman, Montreal, Q.—Harps, violoncellos, counterbass, and violin. 327
 79 Sheppard, W. G., Quebec, Q.—Violoncello, 1712. 327
 80 Murphy, Wm., Petit Codiac, N. B.—Cabinet organ. 327
 81 Gates, E. E., Halifax, N. S.—Cabinet organs. 327
 82 Brockley & Co., Halifax, N. S.—Upright piano and stool. 327

Engineering, Architecture, Maps, etc.

- 83 Gray, E. Wood, Quebec, Q.—Engineering drawings. 330
 84 Cousin, Paul, Quebec, Q.—Map of city of Quebec, etc. 330
 85 Berlinguet, F. H., Quebec, Q.—Bridge models. 330
 86 Trout, W. H., Peterborough, Ont.—Mechanical drawings. 331
 87 Johnstone, J., Ottawa, Ont.—Geographical drawing. 335
 88 Burpee, M., Upper Sheffield, N. B.—Mechanical drawing. 335
 89 Honeyman, Dr., Halifax, N. S.—Geological map of Nova Scotia. 335
 90 Anderson, A. T., Br. Col.—Physical map of British Columbia. 335

Physical, Social, and Moral Condition of Man.

- 91 Sarge, H. J., Toronto, Ont.—Indian clubs, gymnasium, etc. 340
 92 The Corporation of Toronto, Toronto, Ont.—Photographic view of Toronto. 345
 93 Bank, F., Montreal, Q.—Sewer ventilator. 345
 94 Garand, R. G., Montreal, Q.—Patent stench trap. 346



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(North of Nave, Columns 39 to 53.)

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- 3 Bapterosses, F., Paris.—School materials. 300
- 4 Desbarolles, Paris.—Works on penmanship. 300
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- 6 Godchaux, Aug., & Co., Paris.—Copy books. 300
- 7 Le Brun, Paris.—Elementary dictionaries. 300
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- 15 Mouret, Paris.—Globe. 301
- 16 Levesque, Villeneuve St. Denis (Seine and Marne).—Metrical system. 301
- 17 Eloffe & Co., Paris.—Works on natural history; terrestrial globes. 301
- 18 Level, Paris.—Metrical and graphic systems. 301
- 19 Le Cointe, Evreux (Eure).—Arithmetical problems. 302
- 20 National School of Engineering, Paris.—Documents and reports of the school. 302
- 21 National School of Mines, Paris.—Documents and reports of the school. 302
- 22 Méilot, A., Paris.—Music method. 302
- 23 Dauphin, Lunéville (Meurthe and Moselle).—Printing in relief for the blind. 303
- 24 Dupont, Paul, Paris.—Works on government and education. 306
- 25 Duployé Brothers, Paris.—System of stenography. 306
- 26 Dunod, Paris.—Classic and scientific publications. 306
- 27 Dumaine, J., Paris.—Military books. 305
- 28 Ducrocq, P., Paris.—Children's books. 306
- 29 Ducher & Co., Paris.—Works on art and architecture; chromo-lithographs, engravings, and photographs. 306
- 30 Didier & Co., Paris.—Academical books. 306
- 31 "Gazette des Beaux Arts," Paris.—Specimens of the paper and its engravings. 306
- 32 Gauthier-Villars, Paris.—Scientific books. 306
- 33 Furne, Jouvet, & Co., Paris.—General literature. 306
- 34 Firmin-Didot & Co., Paris.—Printing and stationery. 306
- 35 Laboulaye, Ch., Paris.—Dictionary of arts and manufactures, and works concerning industrial art. 306
- 36 Jouaust, D., Paris.—Fine stationery. 306
- 37 Jacquemin, Paris.—Historical costumes. 306
- 38 Hetzel, J., & Co., Paris.—Books. 306
- 39 Hennuyer, Paris.—Books. 306
- 40 Hachette & Co., Paris.—Illustrated works. 306
- 41 Guillaumin & Co., Paris.—Works on political economy and finance; "Journal des Economistes." 306
- 42 Guérin, L., & Co., Paris.—Works on science and art. 306
- 43 Lemerre, Alphonse, Paris.—Classical works. 306
- 44 Desteract, A., Paris.—Account books. 306
- 45 Leroy, Andre, Angers (Maine and Loire).—Pomological dictionary. 306
- 46 Leroy, P. N., Paris.—Illustrated historical works. 306
- 47 Maisonneuve & Co., Paris.—Books. 306
- 48 Loones, Paris.—History of painters. 306
- 49 Maison Rustique Agricultural Library, Paris.—Works on agriculture and horticulture. 306
- 50 Mareil, H. De, New York.—Work on the commerce and industry of the United States. 306
- 51 Mame, A., & Son, Tours.—Classical works. 306
- 52 Masson, G., Paris.—Works on medicine, natural history, etc. 306

Publications, Scientific Instruments, Watches.

- 53 Morel, Mrs. A., & Co., Paris.—Works on architecture. 306
- 54 Plon & Co., Paris.—Illustrated works on history, jurisprudence, etc. 306
- 55 Delahaye, V. A., & Co., Paris.—Works of the Biological Society and the Anatomical Society of Paris. 306
- 56 Delagrave, Ch., Paris.—Geographical and classical books. 306
- 57 Ballue, A., Paris.—Illustrated publications. 306
- 58 Balny, A., Espaubourg (Oise).—Work on agriculture. 306
- 59 Baudry, T., Paris.—Works on engineering, mechanics, mining, metallurgy, and railroads. 306
- 60 Beckensteimer, Lyons.—Works on electricity. 306
- 61 Belin, Mrs., Paris.—Classical books; maps in relief. 306
- 62 Belleville, Col., Toulouse.—Report on hydrophobia; physiological reports. 306
- 63 Boulanger, Mrs., Paris.—Books. 306
- 64 Calman, Lévy, Paris.—Literature, history, and modern drama. 306
- 65 Charpentier & Co., Paris.—Various publications. 306
- 66 Colin & Co., Paris.—Classical books. 306
- 67 Reinwald, E., & Co., Paris.—Books. 306
- 68 Rothschild, J., Paris.—Books. 306
- 69 Rudy, Charles, Paris.—The Chinese mandarin language. 306
- 70 Staaff, Paris.—Work on military tactics. 306
- 71 Tanera, Paris.—Topographical maps and plans of battles; military books. 306
- 72 Thirion, Ch., Paris.—Inventors' and patentees' tablets. 306
- 73 Central Union of Fine Arts, Paris.—Albums and publications. 306
- 74 Chervin, Paris.—Method of curing stammering. 306
- 75 Dron, Paris.—Commercial books. 306
- 76 City of Paris.—Statistics, regulations, models, programmes, reports, books, and scholars' work of the schools of Paris; report on primary instruction by Mr. Gréard. 306

Institutions and Organizations.

- 77 Department of Public Education, Paris.—Regulations of the French Institute, the College of France, and the National Library; books and catalogues; report on primary education at the Vienna Exposition. 310
- 78 Chaix, A., & Co., Paris.—Scientific books. 311
- 79 Industrial School, St. Quentin and Aisne.—Albums, cartoons, etc. 311
- 80 Elementary Education Society, Paris.—Pupils' works and report. 311
- 81 Publishers', Printers', and Stationers' Club, Paris.—Publishing, printing, and stationery. 311
- 82 City of Paris.—Catalogue of the French section of the London Exhibition. 312

- 83 Bouvier, A., Paris.—Skeletons of gorillas; catalogue of the birds of Central Africa; map. 312
- 84 Department of Agriculture and Commerce, Paris.—Prizes awarded to agriculturists by various fairs. 312

Scientific and Philosophical Instruments and Methods.

- 85 Alvergnyat Bros., Paris.—Scientific instruments. 320
- 86 Grivolat, L., Paris.—Solar clock. 320
- 87 Lion & Guichard, Paris.—Barometers, thermometers, and pyrometers. 320
- 88 Louvet, A., Pont L'Evêque (Calvados).—Support for instruments 320
- 89 Optical Society, Paris.
 a Mathematical instruments. 320
 b Optical instruments. 324
- 90 Malligand Ed., jr., Paris.—Alcohol tester. 320
- 91 Naudet & Co., Paris.—Barometers. 320
- 92 Perreaux, L. G., Paris.—Instruments of precision, and indicating apparatus. 320
- 93 Colange, Leo de, Philadelphia.—Automatic indicator. 321
- 94 Haas, B., jr., & Co., Paris.
 a Carriage controllers. 321
 b Clocks, watches, musical boxes, and singing birds. 323
- 95 Nicolas & Chamon, Paris.—Water meters. 321
- 96 Rigollot, Paris.—Water meter. 321
- 97 Rubolti, Cesar, Grenoble.—Spigot meter. 321
- 98 Deschiens, Paris.—Calculating machines. 321
- 99 Fialont, Mrs., Paris.—Measuring tapes. 322
- 100 Chameroy & Co., Paris.—Scales. 322
- 101 Deleuil, Paris.—Photometer, scales, and pneumatic machines. 322
- 102 Panier, Ernest, Paris.—Mathematical instruments. 322
- 103 Paupier, Leonard, Paris.—Scales for railroads. 322
- 104 Trayvou, B., Paris.—Scales. 322
- 105 Savary & Rondeleux, Paris.—Gold and silver watches. 323
- 106 Boucher-Gravet, Paris.—Clocks. 323
- 107 Cressier, E., Besançon.—Watches and clocks. 323
- 108 Bréguet & Co., Paris.—Chronometers. 323
- 109 Farcot, Eugène, Paris.—Clocks. 323
- 110 Gondy, J. B., & Co., Pontarlier (Doubs).—Watches. 323
- 111 Malfait, F., & Co., Paris.—Clocks. 323
- 112 Marrel, J. E., Paris.—Clocks. 323
- 113 Mayet-Tissot, Morez (Jura).—Regulators. 323
- 114 Rodanet, A. H., Paris.—Marine and pocket chronometers, watches, and chains. clocks, registers. 323

Scientific, Philosophical, Musical Instruments, Engineering.

- 115 Süßfeld, Lorsch, & Co., Paris.—Marble clocks. 323
- 116 Vignon, A., Paris.—Clocks. 323
- 117 Lachenal, Favre, & Co., Paris.—Stereoscopes with views on glass. 324
- 118 Bardou & Sons, Paris.—Optical instruments. 324
- 119 Darlot, Paris.—Photographic apparatus and photographs. 324
- 120 Derogy, Paris.—Optical instruments. 324
- 121 Duboscq, J., Paris.—Optical instruments. 324
- 122 Feil, Charles, Paris.—Optical goods. 324
- 123 Henry-Lepaute, Paris.—Lenses for lighthouses. 324
- 124 Hoel, J., Paris.—Spectacles and eyeglasses. 324
- 125 Lacombe, Paris.—Opera glasses. 324
- 126 Nachet, A., Paris.—Microscopes. 324
- 127 Secrétan, Paris.—Astronomical and scientific instruments. 324
- 128 Radiguet, Paris.—Mirrors. 324
- 129 Loiseau, A., Son, Paris.—Electrical apparatus. 325
- 130 Bréguet, Paris.—Models of magneto-electric machines for laboratories. 325
- 131 Carré, E., Paris.—Pneumatic pumps, electrical machines, and light regulators. 325
- 132 Janin, Paris.—Magnets. 325
- 133 Gramme's Magneto-Electric Machine Co., Paris.—Galvano-plastic machine, etc. 325
- 134 Walcker, A. G., Paris.—Pneumatic and telegraph bells applied to the navy and railways. 326
- 135 Alexandre & Son, Paris.—Church and parlor organs. 327
- 136 Angot & Dubreuil, Ivry-la-Bataille (Eure).—Wooden musical instruments. 327
- 137 Beunon, Paris.—Upright piano. 327
- 138 Baudet, Paris.—Pianos. 327
- 139 Bontems, B.—Singing and moving birds. 327
- 140 Brunning, Otto, Paris.—Upright pianos. 327
- 141 Debain & Co., Paris.—Mechanical piano. 327
- 142 Focké & Son, Paris.—Pianos. 327
- 143 Fortin Bros., Paris.—Felts for pianos. 327
- 144 Gavioli, C., Jr., Paris.—Pianos and organs; automatic musical instruments. 327
- 145 Gavioli & Co., Paris.—Organs, pianos, flutes, and band instruments. 327
- 146 Gehrling, Ch., jr., Paris.—Piano movements. 327
- 147 Goumas, P., & Co.,—Wind musical instruments and saxophone. 327
- 148 Koenig, Rudolph, Paris.—Acoustic apparatus. 327
- 149 Kriegelstein & Co., Paris.—Pianos 327
- 150 Lecomte, A., & Co., Paris.—Musical instruments. 327
- 151 Lemaire, Paris.—Eyeglasses, opera glasses, etc. 327
- 152 Mennesson, Emil, Reims.—Violins, altos, bass, and double bass. 327
- 153 Morand & Tourneur, Paris.—Mechanical harmoniums. 327
- 154 Thibouville, Lamy, Paris.—Musical instruments. 327
- 155 Zimmermann, Henry, Paris.—Organ pipes. 327
- Engineering, Architecture, Maps, etc.**
- 156 Suez Canal Co., Paris.—Maps and plans of the Suez Canal. 330
- 157 Caligny, A. de, Versailles.—Report on hydraulics. 330
- 158 Blanchet, A. P., Henrichemont (Cher).—Projected channel through Nicaragua. 330
- 159 Chanudet, L., Neuilly-sur-Seine.—Model of wooden pavement. 330
- 160 Le Moulmier, Paris.—Sample of pavement. 330
- 161 Department of Public Works, Paris.
- a* Roads, bridges, viaducts, dams, hydraulic press, docks, embankments, aqueducts, and reservoirs. 330
- b* Railroads; steel rails, depôts, rolling stock, etc. 332
- c* Navigation; light houses, buoys, and beacons, with apparatus for lighting; life-saving apparatus from the Life-Saving Society. 334
- d* Geological and agricultural maps, etc., of France; reports and documents from the National School of Mines. 335
- 162 Monteil & Cassaynes, Paris.—Technical report upon the Suez Canal. 330
- 163 City of Paris.—Reports of the various departments of the city of Paris, maps, plans, etc.; projected and completed bridges by Mr. Legrand; promenades by Mr. Alphand; architectural reports of public buildings by Messrs. Ballu, Baltard, Duc, Davioud, Magne, and Fernique; portfolio of engravings of monuments; historical works; plan of Paris by Quesnal; archæological reports by Vacquer; photographs; reports and plans of the sewers of Paris. 330
- 164 Edoux, Leon, Paris.—Special system for mountain railroads. 332
- 165 Transatlantic Steamship Co., Paris.—Model of the steamship "Pereire." 334
- 166 Beaumarchey, Louis, Aix (Provence).—Astronomical maps and pictures, astronomical indicator, cosmographic apparatus. 335
- 167 Fay, de, War Department, Paris.—Relief plans. 335
- 168 Erhard, Paris.—Geographical maps. 335
- 169 Furne, Jouvet, & Co., Paris.—Geographical military atlas adopted by the military school of St. Cyr. 335
- 170 Italo, Henry d', Paris.—Geographical works, atlas, and maps. 335
- 171 Thomas, Paris.—Chronometric and cosmographic instruments. 335

Physical, Social, Moral Condition of Man.

- 172 Wührer, L., Paris.—Geographical maps. 335
 173 Lienard, F.—Plans in relief, of Paris and Jerusalem. (*In Park.*) 335

Physical, Social, and Moral Condition of Man.

- 174 Brière, Jules, Alençon (Orne).—Nursing nipples. 340
 175 Carue, Paris.—Gymnastic apparatus. 340

- 176 Paz, E., Paris.—Gymnastic apparatus. 340
 177 Regnier, Paris.—Economical wooden roofing. 342
 178 Thirion, Ch., Paris.—Writing tablets. 343
 179 Marbeau, Paris.—Plans, documents, etc., of a foundling hospital. 346
 180 City of Paris.
 a Reports of the municipal authorities. 345
 b Reports of the municipal lying-in asylum by Dr. Tarnier. 346

GERMANY.

(*South of Nave, Columns 28 to 38.*)

Publications.

Educational Systems, Methods, and Libraries.

COLLECTIVE EXHIBIT OF THE BOOK TRADE AND PRINTING INDUSTRIES OF GERMANY.—BOOKS, LITHOGRAPHIC PRINTS, COPPER-PLATE AND XYLOGRAPHIC WORK, MAPS, PHOTOGRAPHS, GRAPHIC, AND OTHER METHODS OF INSTRUCTION, TYPE FOUNDERS' WORK. 300-306

- 1 Theodore Ackermann, Munich.
- 2 Amelang, C. F., Leipsic.
- 3 André, Joh., Offenbach-on-Main.
- 4 Anton, Ed., Halle-on-Saale.
- 5 Bach's, J. G., Lithographic Institution, Leipsic.
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- 32 Fleischer, Ernst, Leipsic.
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- 36 Fries, Hermann, Leipsic.
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- 60 Bibliographic Institute, Leipsic.

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 - 62 Photo-lithographic Institute, Weimar.
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 - 64 Julien Publishing House (L. Kressner), Würzburg.
 - 65 Kaeseberg, Hugo, Leipsic, Xylographic Institute
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 - 86 Naumann, Justus, Leipsic.
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 - 96 Römmler & Jonas, Dresden.
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 - 99 Schönfeld, G., Dresden.
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 - 101 Schotte & Co., Ernst, Berlin.
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 - 103 Schulz Court Book Store, Oldenburg.
 - 104 Seemann, E. A., Leipsic.
 - 105 Seitz, Gustav W., Wandsbeck.
 - 106 Siegismund & Volkening, Leipsic.
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 - 108 Soenneken, Fr., Remscheid.
 - 109 Spamer, Otto, Leipsic.
 - 110 Speemann, W., Stuttgart.
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 - 132 Wigand, Otto, Leipsic.
 - 133 Winter, C. F., Leipsic.
 - 134 Wolf, Adolph, Dresden.
 - 135 Zahn, R. von, Dresden.
 - 136 Zernin, Edoard, Darmstadt.
-
- 137 Hermes, Wilhelm, Berlin.—Drawing instructor and studies. 300
 - 138 Saal, Franz Otto, Coblenz.—Drawing of a cleft palate. 302
 - 139 Grothe, Hermann, Berlin.—Apparatus for instruction in technological schools. 302
 - 140 Loeff, Paul, Berlin.—Books of instruction and plans of technological manufacturing establishments. 302
 - 141 Raumer, C. V., Warmbrunn, Silesia.—Instruction book for the manufacture of bricks. 302
 - 142 Blankenhorn, A., Carlsruhe.—Instruction books for wine growing and agriculture. 302
 - 143 Keller, Heinrich, Son, Darmstadt.—Herbarium containing forest and field grasses. 302
 - 144 Schröder, J., Polytechnic Industrial Institute, Darmstadt.—Models for teaching purposes, drawing appliances. 302
 - 145 Lette Association, Commercial and Trades School, Berlin.—Placard relating to the labors of the Association. 302
 - 146 Manheim Commercial School, C. Ohngemach.—Instructor in bookkeeping.
 - 147 Moeser, W., Berlin.—Sundry literary works. 306
 - 148 Bavarian Technological Museum, Nuremberg.—Weekly journal, "Für Kunst u. Gewerbe u. Kunstgewerbliche Gegenstände." 306
 - 149 Spiller, Philipp, Berlin.—Sundry publications. 306
 - 150 Studnitz, Arthur von, London.—Scientific book. 306
- Scientific and Philosophical Instruments and Methods.
- 151 Riefler, Clem., Maria-Rhein, near Kempten.—Mathematical instrument cases. 320

Philosophical, Scientific, Musical Instruments, Clocks.

COLLECTIVE EXHIBIT OF NUREM-
BERG MATHEMATICAL INSTRUMENT MAN-
UFACTURERS. 320

152 Schoenner, Georg, Nuremberg.

153 Bayer, Jean, Nuremberg.

154 Heissinger, Ludwig, Nuremberg.

155 Schultze, G. A., Berlin—Philo-
sophical apparatus. 321156 Sartorius, F., Göttingen.—Analyt-
ical scales. 322COLLECTIVE EXHIBIT OF THE
BLACK FOREST CLOCK MANUFACTUR-
ERS. 323157 Lenzkirch Joint Stock Co., Lenz-
kirch.

158 Schwer, Benedict, Triberg.

159 Manufacturing Co., Haas, Ph., &
Sons, St. Georgen.

(Manufacturers' Union, Furtwangen.)

160 Wehrle & Co.

161 Kaltenbach, Hector.

162 Retterer, Felix.

163 Bob, Lorenz.

(Manufacturers' Union, Villingen.)

164 Benk, Gustav.

165 Weishaupt & Fleig.

166 Feser, Paul, Villingen.

167 Maurer & Höfler, Eisenbach.

168 Zimmer, J., Furtwangen.

169 United Clockmakers of Glasshütte,
Saxony.—Clock parts. 323170 Becker, Gustav, Freiburg, Silesia.
—Regulators. 323171 Felsing Conrad, Berlin.—Regula-
tors, etc. 323172 Hadank & Son, Hoyerswerda, Up-
per Lausitz.—Steeple clock and bell. 323173 Lange, A., & Sons, Glashütte, Sax-
ony.—Watches. 323174 Voigtlander & Son, Brunswick.—
Optical instruments. 324175 Joint Stock Co., for Telegraph Sup-
plies, Berlin.—Insulators. 326COLLECTIVE EXHIBIT OF MUSI-
CAL INSTRUMENTS AND STRINGS 327176 Pfretzschner, G. A., Marknenkir-
chen, Saxony.177 Bauer, Albin, jr., Marknenkirchen,
Saxony.178 Paulus & Schuster, Marknenkir-
chen, Saxony.179 Schuster, C. G., jr., Marknenkir-
chen, Saxony.180 Dürschmidt Bros., Marknenkir-
chen, Saxony.181 Glier, K. A., jr., Marknenkirchen,
Saxony.182 Adler, Richard, Marknenkirchen,
Saxony.183 Kämpffe, Gustav, Marknenkirchen,
Saxony.184 Paulus, Ernst, Marknenkirchen,
Saxony.185 Paulus, August, Marknenkirchen,
Saxony.

186 Vogel & Son, J. G., Plauen, Saxony.

COLLECTIVE EXHIBIT OF MOUTH
HARMONICAS. 327

187 Bilger, Chr., Tressingen.

188 Hohner, Math., Tressingen.

189 Koch, Andreas, Tressingen.

190 Messner & Co., Tressingen.

191 Hotz, Fr., jr., Knittlingen.

192 Jäger, Gottlob, Knittlingen.

193 Jäger, Joshua, Knittlingen.

194 Müller, C. A., Unterwiesenthal.—
Gutstrings. 327195 Welte, Al., & Son, Freiburg, Ba-
den.—Piano. 327196 Euler, A. A., Frankfort-on-Main,
—Clarionets, flutes, etc. 327197 Pfaff, F., Kaiserslautern.—Brass
and wood instruments. 327198 Stratton, John F., Gohlis, near
Leipsic.—Violins, etc. 327199 Altenburg & Graue, Bremen.—
Piano. 327200 Blüthner, Julius, Leipsic.—Concert
grand piano and pianino. 327201 Geyer Bros., W., & Ed., Eisenberg.
—Leather for piano manufacturers' use. 327202 Ibach, Rudolphe, & Son, Barmen.—
Concert grand piano and pianino. 327203 Kaps, Ernst, Dresden.—Concert
grand piano. 327204 Newmann, F. L., Hamburg.—Pi-
ano. 327205 Poehlmann, Moritz, Nuremberg.—
Piano strings. 327206 Schiedmayer, J., Stuttgart.—Con-
cert grand piano and harmoniums. 327

207 Schleip, B., Berlin.—Piano. 327

208 Schlessiger & Lummer, Gera.—
Leather for piano-makers' use. 327209 Schwechten, G., Berlin.—Pia-
nino. 327210 Seiller, Edward, Liegnitz.—Pia-
nino. 327211 Gläsel, Moritz, known as Wiener,
Marknenkirchen.—Guitars, citherns, vio-
lins, etc. 327212 Haslwanter, J., Munich.—Cith-
erns. 327213 Tiefenbrunner, Georg, Munich.—
Citherns. 327214 Walcker, E. F., & Co., Ludwigs-
burg.—Church organ. 327215 Huber Bros., Pirmasens, Bavaria,
Palat.—Hand organ. 327216 Trayser, Ph. J., & Co., Stuttgart.—
Harmonium. 327217 Stahlecker, C. T., Stuttgart.—Pia-
nos. 327Physical, Social, and Moral Condition
of Man.218 Jungfer, A., Berlin.—Coins and
commemorative medals. 344

AUSTRIA.

(South of Nare, Columns 23 to 23.)

Educational Appliances, Scientific and Musical Instruments, Engineering

Educational Systems, Methods, and Libraries.

- 1 Municipality of Vienna.—Photographs of objects pertaining to education. 300
- 2 Sommer & Co., Leopold, Vienna.—Instruction boards for illustrating lessons for schools and home. 300
- 3 Artaria & Co., Vienna.—Maps. 300
- 4 Fric, V., Prague.—Collection of objects of natural history and models for schools. 301
- 5 Politzer, Adam, Vienna.—Anatomical, pathological preparations of the organs of hearing. 302
- 6 Entlicher, Fred., Ober Dobling, near Vienna.—Method for the blind. 303
- 7 Kábdebo, Heinrich, Vienna.—Representation of the development of the press in Vienna, in the years 1700 to 1876. 305
- 8 Pechar, John, Teplitz & A. Peltz, Vienna.—Statistics of the import, export, and consumption of cotton in Austria in 1871. 305
- 9 Schonberg, Alois, Vienna.—Manual of spirit and German yeast production. 306

Institutions and Organizations.

- 10 Schreiber, Fred., Vienna.—Music. 313
- 11 Schmitt, Hans, Vienna.—Piano study and compositions. 313

Scientific and Philosophical Instruments and Methods.

- 12 Umann, John, Tiefenbach, Bohemia.—Thermometers. 320
- 13 Kraft & Son, E., Vienna.—Mathematical instruments. 320
- 14 Kreidl, Alois, Prague.—Chemical physical apparatus. 320
- 15 Kreuter, Franz, Bielitz, Silesia.—Tachometer, distance poles, leveling poles. 320
- 16 Lenoir & Forster, Vienna.—Chemical, physical, and mineralogical apparatus. 320
- 17 Pangger, Dr., Trieste.—Nautical instruments. 320
- 18 Florenz, Joseph, Vienna.—Scales and balances, gold and silver precision balances, balance scales, table balances. 322
- 19 Schmidt, John, Vienna.—Measuring and regulating apparatus for petroleum. 322
- 20 Neuhofer, I., Vienna.—Optical and mechanical instruments. 324

- 21 Waldstein, junior, S., Vienna.—Optical and physical instruments. 324
- 22 Richter, C.W., Oedenburg.—Optical instruments, spectacles. 324
- 23 Plossl & Co., S., Vienna.—Mechanical and optical instruments. 324
- 24 Bucher, Ig. Joh., Vienna.—Guitars, violins, strings. 327
- 25 Cerveny, V. F., Koniggratz.—Musical instruments of wood and metal. 327
- 26 Bohland & Fuchs, Graslitz.—Metal instruments. 327
- 27 Fuchs, Daniel, Vienna.—Metal instruments. 327
- 28 Horak, John, Prague.—Instruments of wood. 327
- 29 Farsky, John F., Pardubitz.—Wind instruments. 327
- 30 Kiendl, Anton, Vienna.—Guitar. 327
- 31 Lausmann, John W., Linz.—Wood and metal wind instruments. 327
- 32 Lutz, A., & Co., Schonbach.—Violin. 327
- 33 Messani, John, Prague.—Wind instruments. 327
- 34 Placht Bros., Vienna.—Musical instruments. 327
- 35 Lutz, A., & Co., Vienna.—Musical instruments. 327
- 36 Schamal, Wenzel, Prague.—Brass wind instruments. 327
- 37 Stecher, Karl, Vienna.—Musical wind instruments. 327
- 38 Thie, William, Vienna.—Mouth musical instruments. 329
- 39 Zach, Thomas, Vienna.—Musical instruments. 327
- 40 Kirchner Bros., Vienna.—Guitar and violin strings. 327
- 41 Robitsek, H., Vienna.—Harps. 327

Engineering, Architecture, Maps, etc.

COLLECTIVE EXHIBIT OF ENGINEERING AND ARCHITECTURAL PHOTOGRAPHS, MODELS, DESIGNS, AND REPORTS. 300

- 42 Vienna Building Association, Vienna.
- 43 Baumer, Wilh., Vienna.
- 44 Bayer, Rudolph, Vienna.
- 45 Bomches, Fred., Trieste.
- 46 Claus, Heinrich & Gross, Vienna.
- 47 Delbasso, Pietro, jr., Trieste.
- 48 Doderer, Wilh., Vienna.
- 49 Danube Regulation Commission, Vienna.

Engineering, Social Statistics.

- | | |
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| <p>50 Dorfel, Julius, Vienna.
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 56 Fraenkel, Wilh., Vienna.
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 71 Morawitz, Moriz, Vienna.
 72 Neumann, Franz, jr., Vienna.
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 75 Ponetz, Emanuel, Kolin.
 76 Popovits, Lazar, Marchegg.
 77 Schachner, Friedrich, Vienna.
 78 Schlacher, Joseph, Vienna.</p> | <p>79 Schlimp, Carl, Vienna.
 80 Schmidt, Friedr., Vienna.
 81 Schmidt, Heinrich, Vienna.
 82 Schmoll, Adolph von, Eisenwerth.
 83 Schon, John George, Brunn.
 84 Schvabetz, Emil, Vienna.
 85 Serres, August de, Vienna.
 86 "Stadtbauamt of Vienna."
 87 Steinmann, Theo., Bleiburg, Karuthen.
 88 Straschiripka, Max, Vienna.
 89 Thienemann, O., Vienna.
 90 Waldheim, R. von, Vienna.
 91 Wentzel, Vienna.
 92 Wielemaus, Alexander, Vienna.
 93 Wilhelm, Franz, Vienna.
 94 Winkler, Dr. Emil, Vienna.
 95 Bechar, John, Teplitz.—Geological coal maps of the Austro-Hungarian monarchy. 335</p> |
|--|--|

Physical, Social, and Moral Condition of Man.

- 96 Commission in Vienna for the Philadelphia Exhibition, Vienna.—Graphical representation of the productions and foreign commerce of Austria, of its savings banks, etc. 343
- 97 First Ordinary Civil Social Union of the Austro-Hungarian Monarchy, Vienna.—Representation of the activity and development of co-operative union of the Austro-Hungarian monarchy. 347

SWITZERLAND.

(North of Nave, Columns 52 to 55.)

Educational Publications and Statistics.

Educational Systems, Methods, and Libraries.

- | | |
|---|--|
| <p>1 Board of Education of the Canton of Appenzell Ausserrhoden.—Laws and regulations, books, maps, and plans. 300</p> <p>2 Board of Education of the Canton of Basle City.—Annual accounts of the department of public instruction, reports and prospectus of the schools, school-books, plans of the Bernoullianum, special schools. 300</p> <p>3 Board of Education of the Canton of Berne.—Obligatory and facultative text-books and apparatus used in elementary and higher schools, laws and regulations, reports and plans. 300</p> <p>4 Board of Education of the Canton of Fribourg.—Laws and regulations, books, maps, and plans. 300</p> | <p>5 Board of Education of the Canton of Geneva.—Obligatory and facultative text-books and apparatus used in elementary and higher schools, laws and regulations, reports and plans. 300</p> <p>6 Board of Education of the Canton of Lucerne.—Laws and regulations, books, maps, and plans. 300</p> <p>7 Board of Education of the Canton of Neuchâtel.—Laws and regulations, books, maps, and plans. 300</p> <p>8 Board of Education of the Canton of Solothurn.—Laws and regulations, books, maps, and plans. 300</p> <p>9 Board of Education of the Canton of Zurich.—Obligatory and facultative series of books and apparatus used in elementary and higher schools, models and maps for instruction in drawing, laws and regulations, reports and plans. 300</p> |
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Educational Work, Publications, and Appliances.

- 10 Kindergarten, St. Gallen.—Collection of work and employments for children; "the education of children according to Fröbels principles," by J. Wellauer, director of the orphan asylum St. Gallen, 1872, annual reports, statutes, and prospectus. 300
- 11 Beust, F., Hottingen, near Zurich.—Educational system, constructive method, for children of five to twelve years, text-books, maps, models, apparatus, and pupils' work in mathematics, geography, and natural history. 300
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- 14 Ferri, Felix, Lugano, Ct. Tessin.—Tables and album for the drawing of architectural ornaments. 300
- 15 Ganz, J., Zurich.—Photographs of microscopic preparations for the instruction in natural sciences. 300
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- 22 Paroz, J., Peseux, Ct. de Neuchâtel.—History of pedagogy, elementary instruction, intuitive multiplication table, table for the learning of fractions. 300
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- 28 Saint George, W. H., de Nyon, Ct. de Vaud.—Treatise on the construction and hygiene of school-houses. 300
- 29 Agricultural and Professional Colony of Suisse romande, Serix, near Oron, Ct. de Vaud.—Statutes. 302
- 30 Free School for Apprentices, St. Gallen.—Report of the institution, selection of pupils' work. 302
- 31 Industrial School Association, Zurich and vicinity.—First report, 1875. 302
- 32 Asylum for Girls, B. Rittmeyer & Co., St. Gallen.—Reports, 1869-1873. 302
- 33 Dairy Station, Lausanne, Mont Riond, Canton de Vaud.—Collection of writings on dairying and on Alpine cultivation. 302
- 34 Drawing School of the Board of Trade, St. Gallen.—Competition works of pupils, album of drawings by pupils, school report. 302
- 35 Blind Asylum, Lausanne, Ct. Vaud.—General regulations, Lausanne, 1864; reports, 1873-1874. 302
- 36 Private Blind Asylum, Berne.—Statutes, Berne, 1874; constitutional report, 1862; annual reports, 1861 to 1874. 303
- 37 Deaf and Dumb Asylum, Canton Vaud, Moudon.—Regulations, 1874. 303
- 38 Institution for Deaf Mutes, Aarau, Ct. Aargau.—Report, 1874. 303
- 39 Institution for Deaf Mutes, Riehen, near Basle.—Prospectus, reports, and accounts, 1874; list of lessons, 1875-1876; view of the establishment; travels, by G. Jørgensen; courses of study and appliances of instruction. 303
- 40 Institution for Deaf Mutes, St. Gallen.—Statutes of the Society for the Education of Deaf and Dumb Children, annual reports, 1873-1875. 303
- 41 Institution for Feeble-minded Children, Weissenheim, near Berne.—Annual reports, Berne, 1869 and 1872. 303
- 42 Federal Statistical Office.—Statistics of public instruction in Switzerland, by H. Kinkelmeier. 304
- 43 Federal Polytechnical School, Zurich.—Report on the organization, laws, and regulations, plans of the localities. 304
- 44 Christen, J. J., Aarau.—Manuals for instruction, school-books. 306
- 45 Dalp, J., Berne.—Manuals for instruction, school-books. 306
- 46 Hitz, Chur, Ct. Graubünden.—Manuals for instruction, school-books. 306
- 47 Huber, Jacques, Frauenfeld.—Pedagogical reviews, school-books, drawing, musical works, agricultural instruction. 306
- 48 Meisel, C. J., Herisau, Ct. Appenzell, Inner Rhodes.—Manuals for instruction, school-books. 306
- 49 Orell, Füssli, & Co., Zurich.—Manuals for instruction, school-books. 306
- 50 Sauerländer, H. R., Aarau, Ct. Aargau.—Manuals for instruction, school-books. 306
- 51 Scheitlin & Zollikofer, St. Gallen.—Collection of manuals, books of instruction, maps. 306
- 52 Shulthess, Friedr., Zurich.—Manuals for instruction, school-books. 306

Institutions and Organizations.

- 53 Federal Statistical Office.—The savings banks of Switzerland by J. L. Spyri, statistics of the newspapers in Switzerland by Kinkelmeier, history of the schools of the canton of Berne by J. J. Kummer. 311
- 54 Swiss Geodetical Commission.—Determination of longitudes, determination of pendulum-lengths, leveling of Switzerland. 311

Institutions, Scientific Instruments, Watches.

- 55 Swiss Geological Commission.—Geology and geological maps of Switzerland. 311
- 56 Swiss Meteorological Commission.—Meteorological observations. 311
- 57 Swiss Statistical Society.—The mutual relief societies of Switzerland in 1865 by H. Kinkel, the public libraries in Switzerland in 1868 by E. Heitz. 311
- 58 Swiss Society for the Advancement of Natural Philosophy.—New memoirs, minutes and reports, history of the society, statutes, list of members. 311
- 59 Swiss Historical Society.—List of documents on Swiss history, archives of Swiss history, indicator for Swiss history (informers). 311
- 60 Swiss Alpine Club.—Annual reports, itineraries, maps. 311
- 61 Association of the Canton of Aargau for the Advancement of Natural Philosophy.—The scarcity of water in the canton of Aargau, paper read at the 50th session, map of erratic blocks. 311
- 62 Historical Society, St. Gallen.—Reports, annual papers. 311
- 63 Society for the Advancement of Natural Philosophy, Basle.—Proceedings 1867-1873, paper read at the 50th anniversary. 311
- 64 Society for the Advancement of Natural Philosophy, Berne.—Proceedings 1843-1874. 311
- 65 Society for the Advancement of Natural Philosophy of the Canton of Graubünden.—Annual reports, statutes, papers on natural sciences.
- 66 Society for the Advancement of Natural Philosophy of the Canton of St. Gallen.—Reports and proceedings 1858-1874, and speech at the 50th anniversary by Dr. Wartmann.
- 67 Observatory, Neuchâtel.—Reports and divers papers, photographs of astronomical instruments.
- Scientific and Philosophical Instruments and Methods.
- 68 Gysi, Fr., Aarau, Ct. Aargau.—Complete collection of mathematical drawing instruments. 320
- 69 Herman & Pfister, Berne.—Polaristrometers, hair-hygrometers, metallic thermometer. 320
- 70 Hipp, M., Neuchâtel.—Telegraph apparatus, Morse's system; apparatus for controlling the speed of railway trains; regulators, registering apparatus tower, double-dial, and electric clocks, chronoscope and chronograph with auxiliary apparatus. 320
- 71 Kern, J., Aarau, Ct. Aargau.—Swiss drawing instruments, transits, theodolites, leveling instruments. 320
- 72 Amsler-Laffon, J., Schaffhausen.—Planimeters, integrators, Woltmann's current meter with electrical indication. 321
- 73 Aebi & Landry à Madretsch près Bienne, Ct. de Berne.—Watches and pieces showing the successive phases of the fabrication. 323
- 74 Watch-makers' Union (J. B. Gondy & Co.), Chaux-de-Fonds, Ct. Neuchâtel.—Gold and silver watches. 323
- 75 Antony-Bovy, J. E., Chaux-de-Fonds, Ct. Neuchâtel.—Watch-hands, stems, rings, detached parts for stem-winders, steel cogwheels. 323
- 76 Aubert frères Savagnier, Ct. Neuchâtel.—Springs for watches. 323
- 77 Audemars, Ls., Brassus, Ct. Vaud.—Watches and chronometers. 323
- 78 Badollet, J. M., & Co., Geneva.—Watches and pocket chronometers. 323
- 79 Bæhni, frères, Bienne, Ct. Berne.—Hairsprings of steel, tempered. 322
- 80 Berlie, Edouard, Geneva.—Lamina of hardened steel for lithographic pens and springs of watches, tools and gravers. 323
- 81 Besancet-Blanc, Eug., Travers, Ct. Neuchâtel.—Ruby jewels for watches, cap jewels, jewelring of a repeating watch, two bridges with jewels set in gold, duplex rollers, English style; impulse jewels for chronometer escapements, cylinders and plugs. 323
- 82 Bitterlin-Schmidt, J. B., Locle, Ct. Neuchâtel.—Precious stones and jewels for jewelers and watch manufacturers, diamant powder. 323
- 83 Borel & Courvoisier, Neuchâtel.—Chronometers, watches, and movements of watches. 323
- 84 Breting, frères, Locle, Ct. Neuchâtel.—Pocket chronometers, lever escapement, spring with Philipp's system of double-curve. 323
- 85 Chatelain, de la Cour, Albert, Geneva.—Watches, self-winding, triangular lever. 323
- 86 Chatelain, A. & E., Wœlfli, Geneva.—Watches, triangular escapement, self-winding. 323
- 87 Colliot Désiré, St. Imier, Ct. Berne.—Silver watches. 323
- 88 Corcelle, J., & Co., Geneva.—Enamel watch-dials. 323
- 89 Didisheim, Gabriel, St. Imier, Ct. Berne.—Watches. 323
- 90 Ducommun, D., Gorgier, Ct. Neuchâtel.—Movements of watches, stem-winders and key-winders. 323
- 91 Dufaux, Lutz, & Son, Geneva.—Watch spirals. 323
- 92 Ekegrén, Hr., Geneva.—Chronometers. 323
- 93 Favre Bros., Neuveville, Ct. Berne.—Watches of silver and German silver. 323
- 94 Francillon, Ernest, & Co., St. Imier, Ct. Berne, (Longines Watch Co.).—Watches, watch movements, detached pieces for key and stem-winders. 323
- 95 Frankfeld, Louis, & Co., Geneva.—Chronographs, star-watches, movements, patent stem-winders. 323
- 96 Grandjean, Hry., & Co., Locle, Ct. Neuchâtel.—Marine and pocket chronometers, watches. 323
- 97 Grandjean-Perrenoud, Henry, Chaux-de-Fonds, Ct. Neuchâtel.—Engravings for watches. 323
- 98 Honegger, G., Bienne, Ct. Berne.—Movements of platinum-nickel, and parts of watches. 323
- 99 Humbert, Ernest, Locle, Ct. Neuchâtel.—Watches. 323

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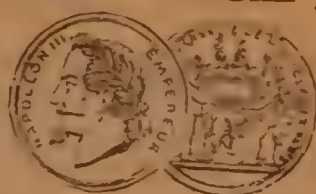
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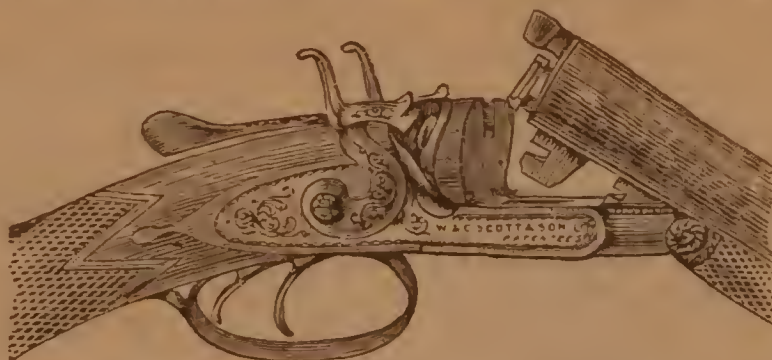
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- 100 Jacot Bros., Locle, Ct. Neuchâtel.—Pocket chronometers. 323
- 101 Jeanjaquet, Chs., Neuchâtel.—Spirals for watches, steel for lithographic pens. 323
- 102 Klein, E., Geneva.—Spirals for watches. 323
- 103 Lehmann, Chs., Bienne, Ct. Berne.—Watches, stem-winders, special system, parts of watches. 323
- 104 Martin, Ch., & Co., Geneva.—Geneva watches, stem-winders. 323
- 105 Matile, H. Ls., Locle, Ct. Neuchâtel.—Precision watches. 323
- 106 Matthey-Doret, Paul, Locle, Ct. Neuchâtel.—Stem-winding chronometers, minute repeaters, chronographs. 323
- 107 Matthey, Son, Auguste, Jaluse, near Locle, Ct. Neuchâtel.—Tempered steel for spirals, wheel chains for stem-winders, balances and spirals for chronometers. 323
- 108 Nardin, James, Locle, Ct. Neuchâtel.—Pocket chronometers, precision watches. 323
- 109 Nardin, Ulysse, Locle, Ct. Neuchâtel.—Precision watches and chronometers, ladies' watches, etc. 323
- 110 Patek, Philippe, & Co., Geneva.—Pocket chronometers and watches. 323
- 111 Perrenoud, Aimé, Terreaux, Geneva.—A constant force escapement for chronometers, assortment of spirals of gold and tempered steel. 323
- 112 Perret's, D., Son, Neuchâtel.—Watches. 323
- 113 Rauss, Ami, Geneva.—Enameled dials for watches. 323
- 114 Rigtrup, R. S., Locle, Ct. Neuchâtel.—New mechanism for Lepine watches without fuzée. 323
- 115 Robert-Theurer & Son, Bienne, Ct. Berne.—Watches. 323
- 116 Sandoz, Lucien & Son, Locle, Ct. Neuchâtel.—Gold watches of various systems and different qualities. 323
- 117 Stahl, Maurice, Chaux-de-Fonds, Ct. Neuchâtel.—Chronometers and watches. 323
- 118 Taglieb, Carl, Zurich.—Watch in a finger-ring, to wind up and to turn the hands without key. 323
- 119 Adank, J. Jaques, & Co., Ste. Croix, Ct. Vaud.—A musical box, mandoline, with zither. 327
- 120 Brémont, B. A., Geneva.—Musical boxes. 327
- 121 Karrer & Co., Teufenthal, Ct. Aargau.—Musical boxes and fancy articles. 327
- 122 Karrer, S., Teufenthal, Ct. Aargau.—Musical boxes. 327
- 123 Paillard, C., & Co., Ste. Croix, Ct. Vaud.—Sublime harmonies, musical boxes. 327
- 124 Troll's Son, Samuel, Geneva.—Musical boxes. 327
- 125 Trost, J., & Co., Zurich.—Upright piano forte. 327

(Machines and tools pertaining to watch-making are also exhibited in this department, but classified under class 535.)

Engineering, Architecture, Charts, Maps, etc.

- 126 Ostermundigen Joint Stock Quarrying Co., Ct. Berne.—System of working the quarries. 330
- 127 Building Department of the Canton of Basle-Stadt.—Plans for the enlargement of the city of Basle. 330
- 128 Building Direction of the Canton of Aargau.—System of roads, wooden bridges, canals, waterpower. 330
- 129 Building Inspection of the Canton of Graubünden.—Correction of the Rhine in the Grisons. 330
- 130 Department of the Interior, Swiss Confederation, Berne.—Measures taken to correct and regulate the rivers and waters of Switzerland. 330
- 131 Department of Public Works, Canton of Vaud.—Public works, cost of various roads, drawings of objects of art. 330
- 132 Department of Public Works of the Canton of Berne.—Plans, maps, atlases, literary works, bridges for public roads, correction of rivers of the Jura mountains. 330
- 133 Swiss Society of Engineers and Architects.—The Swiss system of roads, iron bridges, water supply and canalization in Swiss towns. 330
- 134 Municipality Chaux-de-Fonds, Ct. Neuchâtel.—Plans of the town of La Chaux-de-Fonds, 1794-1841, and for its enlargement. 330
- 135 Government of the Canton of St. Gallen.—System of roads and highway bridges, correction of the Rhine. 330
- 136 Rothenbach, Director of the City Gas and Water Works, Berne.—Gas works of Berne. 330
- 137 Rieter, Joh. Jacob, & Co., Winterthur, Ct. Zurich.—Photographs of turbines with accessories, and of wire-rope transmissions. 331
- 138 Weissenbach, W. C. E., Zurich.—The water-powers of Switzerland. 331
- 139 Department of Railroads and Commerce, Swiss Confederation, Berne, Bureau of Statistics.—Statistics of Swiss railways. 332
- 140 Department of Railroads and Commerce, Swiss Confederation, Berne, Scientific Bureau.—Standard drawings, forming part of the government regulations for Swiss railways. 332
- 141 Department of Railroads and Commerce, Swiss Confederation, Berne, Gotthard Inspection.—Report of the Gotthard railway, geological tables and sections. 332
- 142 Railroads of Jura-bernoise.—Photographs of railway works, general plan and longitudinal sections, railway construction, Zimmeregg tunnel. 332
- 143 Gotthard Railway Co.—Longitudinal sections of the line and tunnel, plans, collection of specimens of the most important rocks found in the great tunnel. 332
- 144 Swiss Society of Engineers and Architects.—Development and longitudinal sections of the Swiss railways. 332

Engineering, Architecture, Social and Moral Condition of Man.

- 145 Swiss National Railway Co., Winterthur, Ct. Zurich.—Drawings of bridges. 332
- 146 Swiss Northeast Railway Co., Zurich.—Plans, photographs, etc., of railway construction, its lines, rolling stock, etc. 332
- 147 Swiss Locomotive and Machine Works, Winterthur, Ct. Zurich.—Photographs of locomotives. 332
- 148 Tobler, Chief Engineer of the Utliberg Railway, Zurich.—Description and drawings of the Utliberg railway and its rolling stock. 332
- 149 Tössthal Railway, Winterthur, Ct. Zurich.—Surveys and plans, sections, bridges, carriages with two stories, etc. 332
- 150 Von Würthenau, Chief Engineer of the Swiss Central Railway, Basle.—Plans and drawings for the construction of the new lines. 332
- 151 Department of Forests and Streams, Canton Berne.—Plans of the new military buildings at Berne. 332
- 152 Federal Topographical Bureau.—Maps and atlases of Switzerland. 335
- 153 Leuzinger, R., Berne.—Section of "Grono" from the topographical atlases of Switzerland. 335
- 154 Wurster, Randegger, & Co., Winterthur, Ct. Zurich.—Atlases and maps, scientific works on geography and natural history. 335
- Physical, Social, and Moral Condition of Man.**
- 155 Building Direction, Canton Aargau.—Plans of the lunatic asylum at Königsfelden. 342
- 156 Brunner, Ad. & Fr., Zurich.—Centralhof at Zurich (reconstruction of the old post-office sketches and photographs of Swiss villas. 342
- 157 Department of Public Works of the Canton Vaud.—Plans of the lunatic asylum at Lausanne. 342
- 158 Department of Public Works, Canton Zurich.—Plans of the lying-in hospital at Zurich. 342
- 159 Department of Public Works, Canton Berne.—Plans of new and photographs of existing public buildings. 342
- 160 Ernst, Heinrich, Zurich.—Plans of the children's hospital at Zurich. 342
- 161 Gladbach, Professor at the Federal Polytechnic School, Zurich.—Wood architecture of Switzerland. 342
- 162 Goss, J. E., Geneva.—Plans of the theatre in Geneva. 342
- 163 Guyer, Eduard, Zurich.—Modern hotels, their architecture, arrangement, and management. 342
- 164 Hartmann, Nicolaus, St. Moritz, Ct. Graubünden.—Plans of the villa Schickler in St. Moritz (Engadin), plans of Hof St. Moritz and of the hotels du Lac and Victoria. 342
- 165 Jenzer, Berne.—Private houses in Berne. 342
- 166 Jeuch, Caspr., Baden, Ct. Aargau.—Plans of the barracks in Aarau. 342
- 167 Jung, E., Winterthur, Ct. Zurich.—Photographs and ground-plans of existing dwellings. 342
- 168 Koch, Alex., Zurich.—Plans for private residences and a school-house. 342
- 169 Maring, Basle.—Plans of the hall for the federal singing festival, 1875. 342
- 170 Meyer, Johann, Lucerne.—Plans of churches, hospitals, and hotels. 342
- 171 Moser, Robert, Baden, Ct. Aargau.—Churches and houses of correction. 342
- 172 Municipality de Geneva.—Gallery Rath, school-house at Geneva. 342
- 173 Parquetry Factory, Interlaken, Ct. Bernc.—Plans of Swiss cottages. 342
- 174 Sottovia Giov., Samaden, Ct. Graubünden.—Architectural studies. 342
- 175 Town Council of Winterthur.—Plans of the town-hall. 342
- 176 Stehelin, Basle.—Plans of the theatre and Bernoullianum in Basle. 342
- 177 Wenger, Théophil, Manager of the Kurhaus Beatenberg, Berne.—Sketches of hotel interiors. 342
- 178 Zurich Joint stock Co. (Benevolent Society for Cheap Dwellings).—Plans of cheap dwellings. 342
- 179 Kunz, Heinrich, Zurich (Cotton Manufactories).—Workmen's dwellings at his cotton mill at Windish. 342
- 180 Rieter, Joh, Jacob, & Co., Winterthur, Ct. Zurich.—Workmen's dwellings. 342
- 181 Rittmeyer, B., & Co., St. Gallen.—Workmen's dwellings. 342
- 182 Sarasin & Co., Basle.—Workmen's dwellings. 342
- 183 Sulzer, Bros., Winterthur, Ct. Zurich.—Workmen's dwellings. 342
- 184 Direction of the Zoological Gardens at Basle.—Plans of the zoological garden in Basle. 342
- 185 Swiss Society for Penitentiary Reform.—Plans and views of the principal houses of correction in Switzerland, regulations of organization, documents upon the management of prisons. 345
- 186 Swiss Society for Promoting the Public Welfare.—History, Swiss periodical for public utility. 346
- 187 Society for Promoting the Public Welfare, Ct. Appenzell, Inner Rhodes.—Annual reports. 346
- 188 Society for Promoting the Public Welfare, Basle.—Historical reports, statutes, and pamphlets. 346
- 189 Society for Promoting the Public Welfare, Ct. Glarus.—Reports. 346
- 190 Society for Promoting the Public Welfare, Ct. St. Gallen.—Proceedings. 346
- 191 Society for Promoting the Public Welfare, Canton Zurich.—Statutes, reports, catalogue of popular works. 346
- 192 Geneva Society for Public Utility.—Proceedings, reports. 346
- 193 Vaudoise Society for Public Utility.—Reports. 346

Social and Moral Condition of Man, Art.

- 194 Department of the Interior, Swiss Confederation, Federal Statistical Office.—Statistics of the Swiss establishments for the education of orphans and abandoned children, also for the deaf, dumb, and blind by J. Wellauer and J. Müller. 346
- 195 Swiss Society for Instructing the Poor.—Descriptions of the asylums for the poor, minutes, report of the society of teachers for the poor. 346
- 196 Society for Instructing the Poor, District of Aarau, Ct. Aargau.—Statutes, programmes, contracts, annual reports. 346
- 197 Institution for Instructing the Poor, Canton Basle-Land.—General report. 346
- 198 Institution for Instructing the Poor, Zuzach District, Ct. Aargau.—Statutes, annual reports. 346
- 199 Home Industry Society for Zurich and Vicinity.—Report, statutes, regulations. 346
- 200 Aid Society, St. Gallen.—Annual reports. 346
- 201 Aid Society, Zurich.—Reports, etc. 346
- 202 Mutual Aid Society, Val de Travers, Ct. de Neuchâtel.—Statutes, regulations, general report. 346
- 203 Wellauer, J., St. Gallen.—Report of the society for the education of the poor, Swiss schools for the poor by J. C. Zellweger. 346
- 204 Blösch, Eduard, Berne.—Reports of his orphan asylum in Klein-Wabern, Berne. 346
- 205 Orphan Asylum, Neuchatel.—Reports, contracts, formulas; notes about Belmont. 346
- 206 Orphan Asylum, Daillens-Cossonay-Penthaz, Ct. Vaud.—Regulations and reports. 346
- 207 French Orphan Asylum, Wabern, Ct. Berne.—Report. 346
- 208 Orphan Asylum, Basle.—Description and history, annual reports, publications, plans, and views. 346
- 209 Orphan Asylum, St. Gallen.—The orphan asylum in St. Gall by F. von Tschudi, reports, statutes, plans of buildings, etc. 346
- 210 City Orphan Asylum, Zurich.—Reports, statutes, regulations, photographs, samples of pupils' clothing. 346
- 211 Aargau Reformatory, Olsberg, Ct. Aargau.—Reports. 346
- 212 Grube Institution for Instructing the Poor, Ct. Berne.—Specimens of pupils' work. 346
- 213 Institution for Instructing Poor Girls, Steinhölzli, near Berne.—Report, 1874. 346
- 214 Hosang Foundation, School for the Poor, near Chur.—Regulations for the admission of pupils into the establishment. 346
- 215 Bundner Reformatory, Foral, near Chur, Ct. Graubünden.—Annual reports of the orphan asylum. 346
- 216 Friedeck Reformatory Home, Buch, Hegau, Ct. Schaffhausen.—Historical report, specimens of pupils' work. 346

- 217 Swiss Reformatory, Sonnenberg, near Lucerne.—Statutes, circulars, reports, specimens of pupils' work, etc. 346
- 218 Toggenburg Reformatory, Hochsteig, near Wattwyl, Ct. St. Gallen.—Statutes, annual reports. 346
- 219 Victoria Institute for Poor Girls of the Canton of Berne, Klein-Wabern, near Berne.—Regulations for admission, organization, report. 346

Sculpture.

- 220 Abegglen-Perrin, Iseltwald, Ct. Berne.—Chalets, with and without music and clocks. 405
- 221 Abplanalp, J., Brienz, Ct. Berne.—Wood-carvings. 405
- 222 Baumann, A., Vater & Son, Brienz, Ct. Berne.—Wood-carvings. 405
- 223 Bergen, C., von, & Co., Interlaken, Ct. Berne.—Wood-carvings. 405
- 224 Eggler, Jakob, Brienz-Oberdorf, Ct. Berne.—Wood-carvings. 405
- 225 Eggler, Johann, Brienz, Ct. Berne.—Wood-carvings. 405
- 226 Flück, J., Fluhberg, near Brienz, Ct. Berne.—Wood-carvings. 405
- 227 Germann & Eggler, Brienz, Ct. Berne.—Wood-carvings. 405
- 228 Grossmann, Joh., Ringgenberg, near Interlaken, Ct. Berne.—Wood-carvings. 405
- 229 Jäger, Jb., & Co. Brienz, Ct. Berne.—Wood-carvings. 405
- 230 Imboden, Gebrüder, Ringgenberg, near Interlaken, Ct. Berne.—Wood-carvings. 405
- 231 Klein, J. F., & Söhne, Meiringen, Ct. Berne.—Wood-carvings. 405
- 232 Ritschard, Chr., Interlaken, Ct. Berne.—Wood-carvings. 405
- 233 Sterchi, Fritz, Interlaken, Ct. Berne.—Wood-carvings. 405
- 234 Zumbrunn, Schmoker, & Co., Ringgenberg, Interlaken, Ct. Berne.—Wood-carvings. 405

Painting.

- 235 Glardon, C. L., Geneva.—"The Morning," (after Greuze); enamel for a watch, of Badollet's exhibition. Cat. No. 78. 413

Engraving and Lithography.

- 236 Rieter-Biedermann, J., Winterthur, Ct. Zurich.—Printed music and engravings. 421
- 237 Bonnet, Charles & Co., Geneva.—Types, borderings, ornaments cut in wood, for printers and lithographers. 422
- 238 Bonfantini, G. A., Basle.—Typographical album, dedicated to the printers of Philadelphia. 422
- 239 Meyer, Theodor, Schaffhausen.—Wood-cuts. 422
- 240 Westföhl, J., Winterthur, Ct. Zurich.—Catalogue, Swiss section. 422
- 241 Orell, Füssli, & Co., Zurich.—Letterpress plates, chemical engraving, wood engravings reduced, plates for paper money, sample sheets and books. 423

Art, Watchmaking, Machinery.

- 242 Hindermann & Siebenmann, Zurich.—Chromo-lithographs. 424
 243 Knüsli, Caspar, Zurich.—Chromo-lithographs. 424

Photography.

- 244 Charnaux, F., Geneva.—Photographs of the glaciers of Switzerland. 430
 245 Ganz, J., Zurich.—Photographs. 430
 246 Gut, Jean & Co., Zurich.—Photographs. 430
 247 Linck, J., Winterthur, Ct. Zurich.—Photographs. 430
 248 Nicola-Karlen, Emil, Berne.—Swiss photographs. 430
 249 Richard, T., Son, Männedorf, Ct. Zurich.—Album of photographs, Swiss costumes, Swiss myths and traditions, Swiss landscapes. 430
 250 Simona Giorgio, Locarno, Ct. Tessin.—Photographs. 430
 251 Täscher, Gebr., St. Fiden, near St. Gallen.—Photographs. 430

- 252 Zacher, C., Zurich.—Photographs. 430

Machines for Making Watches.

- 253 Borel, Louis, & Co., Couvet, Ct. Neuchâtel.—Machines for equalizing the cogs of wheels, with accessories. 535
 254 Borel-Petitpierre, Ls., Couvet, Ct. Neuchâtel.—Tools and instruments for watch manufacturing. 535
 255 Grobet, François Louis, Vallorbes, Ct. Vaud.—Tools and instruments for watch manufacturing. 535
 256 Keigel, Auguste, Couvet, Ct. Neuchâtel.—Equalizing machine, lathes, tool for forging wheels, deepening tool. 535
 257 Leresche-Golay, Jules, & Co., Vaulion, Ct. Vaud.—Files, tools, and instruments for watch manufacturing. 535
 258 Vautier, Sl., & Sons, Carouge, near Geneva.—Tools and instruments for watch manufacturing and for jewelers. 535

BELGIUM.

(North of Nave, Columns 54 to 59.)

Educational Systems, Publications, and Appliances.

Educational Systems, Methods, and Libraries.

- 1 Arens, Antoine, Namur.—School books. 300
 2 Crevecœur, Henri Stanislas Joseph, Orp-le-Grand (Brabant).—Statistical lists for school teachers. 300
 3 Genonceaux, Louis, Bruges.—School books. 300
 4 Belgian Government Educational Department.—Type of school furniture approved by the Belgian government. 300
 5 Happel, J., Antwerp.—Adjustable desk, perambulators. 300
 6 Landrien, Bernardin, Mechlin.—School books. 300
 7 Licot, Feuillien, Nivelles (Brabant).—Work on drawing. 300
 8 Lory, Delaet, Pierre, Brussels.—Writing method adopted by the Belgian government. 300
 9 Petry, Adolphe, Mons (Hainaut).—Arithmometer. 300
 10 Stebert, Pierre, Tongres, Limbourg.—Essay on education, etc. 300
 11 Van Havermaet, Henry, Brussels.—Furniture used in orphan asylums. 300
 12 Claesen, Ch., Liège.—Works on art. 302
 13 Colinet, Ed., Brussels.—Work on art. 302
 14 Stroesser, Jean-Pierre, Brussels.—Solids represented in profile by metallic wire. 302
 15 Van der Molen, A., & Co., Brussels.—Works on architecture and sculpture. 302
 16 Lebon, Leon, Brussels.—Educational works. 305
 17 Dessain, H., Mechlin, Province of Antwerp.—Prayer, liturgy, and other books. 305
 18 Mertens, Adolphus, Brussels.—Books, engravings, etc. 305
 19 Callewaert Bros., Brussels.—School books, Callewaert's dictionaries. 306
 20 De Cuyper, C., & Noblet, A., Liège.—Works on mining, etc. 306
 21 De Koninck, Laurence Wm., Liège.—Works on paleontology. 306
 22 Destexhe, A. M. T. J., Modave, Province of Liège.—Works on instruction. 306
 23 Dujoux, J. B. C., Brussels.—Special collection of patents. 306
 24 Landrien, Bernardine, Mechlin.—School books. 306
 25 Manceaux, Hector, Mons (Hainaut).—School books. 306
 26 Meeus, Jules, Brussels.—Belgian "Industrial Monitor" (newspaper). 306
 27 Van Holsbeek, Henry, Brussels.—Works on hygiene. 306

Institutions, Scientific Instruments, Condition of Man.

Institutions and Organizations.

- 28 Educational Union, Brussels.—Works on instruction. 310
- 29 Doings of Popular Evening Parties of Verviers, Verviers.—Publications, etc. 310
- 30 Toehomst Society, Antwerp.—Reports, etc. 310
- 31 Vander Maelen, Joseph, Molenbeek St. Jean, near Brussels.—Geographical works. 310
- 32 Namur Artistic Literary Club, Namur.—Annals of the club. 311
- 33 Entomological Society of the Royal Museum of Natural History of Belgium, Brussels.—Reports, etc. 311
- 34 Limbourg Scientific and Literary Society, Limbourg.—Publications. 311
- 35 Artists' Union, International Club of Fine Arts, Liège.—Statutes, etc. 311
- 36 Morning Star Royal Society, Brussels.—Dramatic, literary, and choral society. 313

Scientific and Philosophical Instruments and Methods.

- 37 Gloesener, Michael, Liège.—Physical instruments. 320
- 38 Tyskiewick, Count T. J. C., Brussels.—Apparatus for instruction in fine arts. 320
- 39 Le Boulenge, Paul Emile, Liège.—Telemeter for the battle-field. 321
- 40 Linglin, Edward, Charleroi.—Centrifugal power regulator. 321
- 41 Majolini, Francis, La Louvière (Hainaut).—Platform scale for railroads. 322
- 42 Scheren, O. F., Liège.—Platform scales. 322
- 43 Gloesener, Michael, Liège.
a Electrical apparatus, electrical clock. 325
b Telegraphic apparatus. 326
- 44 Mahillon, C., Brussels.—Wind instruments. 326
- 45 Meerens, Charles, Brussels.—Music and musical works. 327

Engineering, Architecture, Maps, etc.

- 46 Carette Dobbels, D., Meulebeke, near Courtrai, West Flanders.—Lightning rod without joints. 330
- 47 Le Tellier, Adolphus, Saint Gilles, near Brussels.—Filters. 330

- 48 Roelens, Désiré, Ghent.—Plan of a hot-house, heating apparatus with thermosyphon. 715
- 49 Smits, Constantine, Forest, near Brussels.—Model of a park, bird's-eye view, leveling, etc. 730
- 50 Dewalque, G., Liège.—Geological chart. 335
- 51 Malaise, C. H. G. L., Gembloux.—Agricultural chart. 335

Physical, Social, and Moral Condition of Man.

- 52 Dries, Lois Francis, Saint Gilles, near Brussels.—Gymnastics at primary and ward schools, etc. 340
- 53 Schmitz, Peter, Liège.—Treatises on gymnastics. 340
- 54 Brussels Gymnastic Association, Brussels.—Statutes. 340
- 55 Manufacturers' Joint Stock Co., St. Nicholas, East Flanders.—Statutes. 342
- 56 Relief Association for the Needy.—Statutes and annual reports. 346
- 57 Boniotti, Peter, Brussels.—Document relating to the association for free medical assistance. 346
- 58 Royal Society for the Prevention of Cruelty to Animals, Brussels.—Publications, etc. 346
- 59 Warlomont, Dr., Brussels.—Vaccine and its distribution to physicians. 346
- 60 Permanent Commission of Mutual Relief Associations, Belgium.—Reports, etc. 347
- 61 Laurent, Francis, Ghent.—Works on the improvement of the working classes. 347
- 62 Mechlin Savings Bank, Mechlin.—Reports, etc. 347
- 63 Schoenfeld, H., Brussels.—Reports, etc., of the Belgian Medical Profession Pension Fund. 347
- 64 Grivegnée Co-operative Expenditure Society, Grivegnée, near Liège.—Reports, etc. 347
- 65 Mutual Commercial Co., Brussels.—Reports, etc. 347
- 66 Commercial and Industrial Mutual Co., Ghent.—Reports, etc. 347
- 67 Mutual Benefit Association, Xhendremael, near Liège.—Reports, etc. 347

NETHERLANDS.

(North of Nave, Columns 60 to 65.)

Educational Appliances, Institutions, Scientific Instruments, Engineering

Educational Systems, Methods, and Libraries.

- 1 Tjeenk-Willink, H. A., Arnhem.—Earth globes with zinc balls. 300
- 2 The Book Trade, Amsterdam.—Books, school books, newspapers, and periodicals. 300
- 3 Deutgen, L., Groningen.—Paper school board. 300
- 4 Art School, Rotterdam.—Drawings and designs. 300
- 5 Kolkon, F. J. von, Groningen.—Photographs on glass. 300
- 6 Workmen's Art School, Amsterdam.—Drawings. 302
- 7 Verhaar, A. T., Utrecht.—Plaster casts of cattle that died of murrain in 1865. 302
- 8 Workmen's Society, Amsterdam.—Drawings by pupils. 302
- 9 Deaf and Dumb Institute, Groningen.—Reports, 1790-1875. 303
- 10 Blind Institute, Amsterdam.—Relics of printing. 303
- 11 Serraris, P. A., jr., Geertruidenberg.—Writing apparatus for cripples. 303
- 12 Gori, M. W. C., Amsterdam.—Books. 306

Institutions and Organizations.

- 13 Dutch Scientific Society, Haarlem.—Treatise on natural science; archives of the Netherlands. 310
- 14 Teyler's Foundation, Haarlem.—Archives. 310
- 15 Society for the Promotion of Architecture, Amsterdam.—Works on architecture. 311
- 16 Dutch Association for the Encouragement of Industry, Haarlem.—Periodicals published by the Association. 311
- 17 Royal Palace, Het Loo.—Collection of East India arms. 312
- 18 Krelage, J. H., Amsterdam.—Pamphlets. 312
- 19 Dutch Historical and Botanical Association, Amsterdam.—Pamphlets. 312
- 20 Amersfoort, Mrs. H. M., Badhoeve.—"Oratorio"—God's Ubiquity. 313
- 21 Van Gelder, G. M., Schaerbeek.—Piano forte method. 313
- 22 North Holland Musical and Historical Association, Amsterdam.—Publications. 313

- 23 Roothaan, L., Amsterdam.—Music. 313

Scientific and Philosophical Instruments and Methods.

- 24 Harting-Bank, H. J., Utrecht.—Scientific instruments. 320
- 25 Ministry of Finance, Hague.—Scientific instruments. 320
- 26 Olland, H., Utrecht.—Meteorological instruments. 320
- 27 Kerbel, G. H., Amsterdam.—Model of a steam engine. 320
- 28 Van Wetteren, H., Haarlem.—Magnets. 320
- 29 Beins, H., Groningen.—Chemical and physical apparatus. 320
- 30 Muller, J. A., Amsterdam.—Water gauge. 321
- 31 Betou, P. J., Delft.—Instrument measuring 100th part of a millimetre. 321
- 32 Hohwü, A. & T., Amsterdam.—Chronometers and astronomical clock work. 323
- 33 Casseres, A. de, Amsterdam.—Chronometers and astronomical clocks. 323
- 34 Cuypers, J. F., Hague.—Piano. 327

Engineering, Architecture, Maps, etc.

- 35 Ministry of the Interior.—Collection of public works of the Netherlands. 330
- 36 The Channel Co., Amsterdam.—A chart of the channel to the North Sea. 330
- 37 Chambers of Commerce and Industry, Middleburg and Flushing.—Relief chart of harbor. 330
- 38 Polytechnic School, Delft.—Models of a sluice. 330
- 39 Morre, G. J., Delft.—Drawings. 330
- 40 Simon, M., Flushing.—Copper model of gates. 330
- 41 Stang, T., Gravenhage.—Drawings of aqueduct. 330
- 42 Dutch Railroad Co., Amsterdam.—Model of railroad bridge, and drawings. 322
- 43 Nierstrasz, N. H., Hertogenbosch.—Plans and drawings. 332
- 44 Zimmerman, G. P. H., Gonda.—Chart of Suriname River. 335

Physical, Social, and Moral Condition of Man.

Physical, Social, and Moral Condition of Man.

- 45 Boer, F. N., Rotterdam.—Model of cheap boarding house. 342
- 46 Tjeenk Willink, W. E. J.—Drawings and statutes of Workmen's Association. 342
- 47 Association for Improvement of Workmen's Buildings, Leenwarden.—Drawings and statutes. 342
- 48 Association for Improvement of Workmen's Buildings, Gravenhage.—Model block containing four lodgings for workmen. 352

- 49 Association for Encouragement of Manufactures and Industries, Gravenhage.—Drawings of double row of lodgings. 342
- 50 Help Yourself Association, Leenwarden.—Statutes, etc. 342
- 51 Beneficial Association.—Models, drawing, writings, and photographs. 346
- 52 Gori, M. W. C., Amsterdam.—Work hospitals. 346

The "Red Cross."

- 53 Dutch Association for Assisting sick and wounded Soldiers in war time.—Publications. 346

S W E D E N.

(North of Nave, Columns 6 to 11.)

Educational Systems, Work, and Appliances.

Educational Systems, Methods, and Libraries.

- 1 Abraham, Aug., Maäs Floda.—Work by pupils of Maäs School of Home Industry for Boys and Girls. 300
- 2 Alard, A. F., Sirntuna.—Musical staff table. 300
- 3 Bagge, G. B., Paris, France.—Geographical map. 300
- 4 Berggren, A. N., Stockholm.—Method of penmanship. 300
- 5 Cervin, C. G., Hesselby, Stockholm.—Model of a school-house. 300
- 6 Glömsta Manufactory, Huddinge.—Universal school form. 300
- 7 Royal Centennial Commission, Stockholm.—A primary school-house, with accessories of furniture, books, maps, and apparatus for instruction. 300
- 8 Royal Centennial Commission, Stockholm.—Models of elementary school-houses, gymnastical apparatus, etc. 300
- 9 Larsson, J. M., Stockholm.—Geographical maps. 300
- 10 Winslow, A. P., Göteborg.—Herbarium for schools. 300
- 11 Londer, A., Norrköping.—Drawings of gymnastics. 300
- 12 Ostorberg, C. G., Jäder Elskintuna.—School furniture. 300
- 13 Brunius, C. G., Stockholm.—Printed matters in archæology and architecture. 301
- 14 Fries, Th. M., & Nathorst, A. G., Stockholm.—Spitzbergen herbarium. 301
- 15 Ramsay, Ebba, Mrs., Göteborg.—Drawings of Spitzbergen plants. 301
- 16 Windrufva, Sven, Stockholm.—Scandinavian herbarium. 301

- 17 Alnarp Agricultural Institute, Akarp.—Maps and drawings of the farm buildings of the agricultural high school, photographs of its domestic animals, and a collection of plants grown on the farm of the school. 302
- 18 Hennings, R. F., Lund, Orebro.—Herbarium for agricultural schools. 302
- 19 Royal War Department, Stockholm.—Works and drawings by pupils at the military school of Carlberg and military high school of Marieberg. 302

COLLECTIVE EXHIBITION OF THE TECHNICAL ELEMENTARY SCHOOLS AT

- 20 Stockholm.—Works of pupils. 302
- 21 Orebro.—Works of pupils. 302
- 22 Norrköping.—Works of pupils. 302
- 23 Borås.—Works of pupils. 302
- 24 Malmö.—Works of pupils. 302
- 25 Eskilstuna.—Works of pupils. 302
- 26 Staaf, P. O., Stockholm.—Agricultural and sylvicultural text-books. 302
- 27 Wulff, H. A., Applerum, Kalmar.—Scheme of the agricultural school, drawings of farm buildings and implements, with specimens of soil and agricultural products. 302
- 28 Borg, O. E., Manilla, Stockholm.—Combined apparatus for speaking and hearing, for half deaf and dumb; symbolical vocabulary, used for the instruction of deaf and dumb. 303
- 29 Holm, F. F. W., Stockholm.—Model of the gymnastic hall at the institute for deaf and dumb of Manilla, in Stockholm. 304
- 30 Home for the Blind, Stockholm.—Basket work by blind pupils. 303

Educational Appliances, Institutions, Scientific Instruments, Engineering

- 31 Allmänna Institute for the Deaf, Dumb, and Blind, Manilla, Stockholm, by A. J. Lindström.—Pupils' works. 303
- 32 Olsson, Magnus, Malung, Lima (blind, deaf, and dumb).—Willow furniture. 303
- 33 Klemmings Antiquarian Stock Co., Stockholm.—Books printed in Sweden in the 16th, 17th, and 18th centuries, with accounts of the earliest Swedish settlements in America. 305
- 34 Central Printers' Stock Co., Stockholm.—Typographical productions. 305
- 35 Gumaelius Arvid, Örebro.—The newspaper "Allehanda för folket." 306
- 36 Key, Axel M., Stockholm.—Anatomical treatise, periodical papers upon medicine and popular science. 306
- 37 Royal Centennial Commission, Stockholm.—Newspapers at present published in Sweden. 306
- 38 Norstedt & Sons, Stockholm.—Typographical productions. 306

Institutions and Organizations.

- 39 Hammers Museum, Stockholm.—Photographs, catalogues, etc. 312
- 40 Royal Agricultural Society, Luleå.—Laplanders' costumes and utensils. 312

Scientific and Philosophical Instruments and Methods.

- 41 Ekman, F. L., Stockholm.—Apparatus for deep-sea soundings. 320
- 42 Gundberg, J. W. L., Stockholm.—Copper vessels for preserving zoological specimens; zoological sieves. 320
- 43 Leja, Joseph, Stockholm.—Thermometer. 320
- 44 Lindahl, Jos., Stockholm.—Apparatus for deep-sea soundings and dredgings. 320
- 45 Ljungström, J. P., Stockholm.—Geodetic and surveying instruments. 320
- 46 Mörthin, P., Östhammar.—Compass. 320
- 47 Rose, J. L., Upsala.—Magnets and needle-compass for mines. 320
- 48 Theorell, A. G., and Sörensen, P. M., Stockholm.—Meteorograph. 320
- 49 Wiberg, Martin, Stockholm.
 a "Bull-dog apparatus" for deep-sea soundings. 320
 b Logarithmetical tables, calculated and printed by a counting machine; controlling apparatus for railway trains. 321
- 50 Brehmer, E. F. A., Stockholm.—Railway ticket registering apparatus; paging machine. 321

- 51 Ekman, F. L., Stockholm.—Anemometer, rainmeter. 321
- 52 Gjers, Samuel, & Wessberg, Hjalmar, Motala.—Diagram log. 321
- 53 Von Otter, C. G., Baron, Stockholm.—Controlling apparatus. 321
- 54 Pettersson, C. J., Carlshamn.—Calculating machine. 321
- 55 Linderöth, G. W., Stockholm.—Clocks. 323
- 56 Märthin, P., Östhammar.—Astronomical clock, chronometer. 323
- 57 Unge, V. F., Stockholm.—Apparatus for measuring distances for military purposes. 323
- 58 Von Otter, C. G., Baron, Stockholm.—Signal lantern. 324
- 59 Kuntze & Co., Stockholm.—Air telegraphs. 326
- 60 Runqvist, C. R., Stockholm.—Printing telegraph. 326
- 61 Ahlberg & Ohlsson, Stockholm.—Wind instrument of metal. 327
- 62 Billberg, C. H., Göteborg.—Pianos. 327
- 63 Lundholm, C. A., Stockholm.—Church organs and harmoniums. 327
- 64 Malmsjö, I. G., Göteborg.—Pianos. 327
- 65 Procapé, M., Miss, Stockholm.—School organ. 327

Engineering, Architecture, Maps, etc.

- 66 Norrman, C. G. V., Stockholm.—Model of a pontoon bridge. 333
- 67 Bagge, G. B., Paris, France.—Geographical maps. 335
- 68 Erdmann, Edvard, Stockholm.—Geological maps and models. 335
- 69 Royal General's Staff, Stockholm.—Topographical maps. 335
- 70 Royal Directory of Railroads, Stockholm.—Map of railways in Sweden. 335
- 71 Larsson, J. M., Stockholm.—Geographical maps. 335
- 72 Sahlbom, Walfrid, Stockholm.—Map showing the development of the railway communications in Sweden within the years 1854-1874. 335
- 73 Swedish Economical Map Manufactory, Stockholm.—Economical and agromonomical maps. 335
- 74 Swedish Geological Commission, Stockholm.—Geological maps. 335
- 75 Royal Centennial Commission, Stockholm.—Collection of current coins and bank notes in Sweden. 344

NORWAY.

(North of Nave, Columns 4 to 7.)

Education and Science.

Educational Systems, Methods, and Libraries.

- 1 Bergen Common School Board, Bergen.—Collection of materials for a free school. 300
- 2 Sandberg, Andreas, Cand. mag., Christiania.—Models of handwriting. 300
- 3 Boeck, W., and D. C. Danielssen, Christiania and Bergen.—Treatise on skin diseases. 306
- 4 Danielssen, D. C., and W. Boeck, Christiania and Bergen.—Treatise on the elephantiasis. 306
- 5 The Norwegian Association of Tourists, Christiania.—Books, maps, photographs. 306
- 6 Jensen, H. J., Christiania.—“The Illustrated News” and other illustrated works. 306

Scientific and Philosophical Instruments and Methods.

- 7 Wedel Jarlsberg, Ferd., Commodore of the Norwegian Navy, Christiania.—Patent control compasses, log machine. 320
- 8 Petersson, A. J., Christiania.—Calculating machine. 321
- 9 Mostue, Thv., & Co., Christiania.—Scales. 322
- 10 The Adjuster of Weights and Measures, Christiania.—Standard weights and measures of Norway. 322
- 11 Vulcan Foundry and Mechanical Works, Christiania.—Collection of counter scales. 322
- 12 Wedel, Ferd., Jarlsberg, Christiania.—System of night signals. 326
- 13 Aarestrup, J., Bergen.—Piano. 327

- 14 Brantzeg, P., Christiania.—Pianos. 327
- 15 Olsen, Ole, Christiania.—Stringed instruments, wind instruments of metal. 327

Engineering, Architecture, Charts, Maps, and Graphic Representations.

- 16 The Director of the Public Roads of Norway, Christiania.—Maps, drawings, books. 330
- 17 Pihl, C., Chief Director of the Norwegian Railways, Christiania.—Drawings, descriptions, and models of Norwegian narrow-gauge railways. 332
- 18 Geographical Survey of Norway, Christiania.—Maps. 335
- 19 Bucher, Henr., Bergen.—Topographical map, new system. 335
- 20 Collett, Robert, Assistant of the Zoological Museum, Christiania.—Zoo-geographical map of Norway, containing a complete list of the vertebrate animals of the country. 335
- 21 Schubeler, Dr. F. C., Professor of Botany at the University of Christiania.
 - a Plants of Norway. 701
 - b Botanico-geographical map of Norway. 335

Physical, Social, and Moral Condition of Man.

- 22 The Statistical Bureau, Christiania.—Collection of official statistical publications relating to Norway, collection of cartographical representations. 345
- 23 Hagen, J., Christiania.—Leather and skins. 652

ITALY.

(North of Nave, Columns 1 to 5.)

Publications, Institutions, Scientific and Musical Instruments, Engineering

Educational Systems, Methods, and Libraries.

- 1 Angelini, Prof. Rodolfo, Rome.—Specimens of penmanship. 300
- 2 Maineri, Carlo, Milan.—Geographical map in relief. 300
- 3 Ben, Michelangiolo, Verona.—Mathematical maps. 300
- 4 Villa, Cav. Prof. Ignazio, Milan.—Geographical maps. 300
- 5 Palizzolo Gravina, Baron Vincent, Palermo.—Scientific books. 301
- 6 Filopanti, Dr. Prof. Quirico, Bologna.—Book on philosophy. 301
- 7 Italo, Dr. Enrico, Milan.—Objects for the study of geography and other sciences. 301
- 8 Giordano, Prof. Scipione, Turin.—Materia medica. 302
- 9 Perelli, Prof. Luigi, Milan.—Album, with specimens of stenography. 302
- 10 Vigano, Francesco, Milan.—Scientific books. 302
- 11 Claus, Cav. Prof. Niccolo, Milan.—Didactic and linguistical treatises. 302
- 12 Volante, Alessandro, Turin.—Pamphlet on mechanics. 302
- 13 Strazza, Giannina, widow Lucca, Milan.—Collection of music. 302
- 14 Tito di G., Ricordi, Milan.—Collection of music. 302
- 15 Bratti, Seiatilli, & Co., Florence.—Collection of music. 302
- 16 Crotta, Giannina, Milan.—Album of music. 302
- 17 C. Cam. Theophilus, Florence.—School books. 306
- 18 Brigola, Gaetano, Milan.—Scientific and miscellaneous books. 306
- 19 Maino, Antonio, Piacenza.—Books and maps. 306
- 20 Morandi, Felięsta, Milan.—Educational books. 306
- 21 Maltese, Dr. Felice, Vittorio, Sicily.—Book on philosophy. 306
- 22 Guida, Prof. Francesco, Naples.—Book on night signals. 306
- 23 Beccari, Gualberta Alaide, Bologna.—Newspaper, "La Donna." 306
- 24 Barra, Prof. Luigi, Ottajano, Naples.—Didactic book. 306

- 25 Gargiulo, Francesco, Naples.—Descriptive book. 306

- 26 Gravina, Domenico, Palermo.—Illustrated books. 306

Institutions and Organizations.

- 27 Director of the Anatomical and Pathological Museum of Florence.—Microscopic, normal, and pathological anatomical preparations. 311
- 28 Scaraviglia, Torquato, Gualdo Tadino, Umbria.—Album and pictures. 312

Scientific and Philosophical Instruments and Methods.

- 29 Sollima, Giacomo, Messina.—Mill scales. 322
- 30 Villa, Cav. Prof. Ignazio, Milan.—Universal clock. 323
- 31 Gasparini, Giacomo, Rome.—Watches. 323
- 32 Gennari, Cav. Dr. Enrico, Milan.—Optical instruments. 342
- 33 Ponti, Carlo, Venice.—Camaziale and megalithoscope (optical instruments). 324
- 34 Figatner, Enrico, Milan.—Electric batteries. 325
- 35 Gerosa, Edoardo & Emilio, Milan.—Telegraphic instrument. 326
- 36 De Lorenzi, Cav. G. Batta, Venice.—Violins, Stradivarius style. 327
- 37 Bedini, Guiseppe & Sons, Venice.—Harmonic strings. 327
- 38 Venturini, Luigi, Padua.—Harmonic strings. 327
- 39 Giuliano, Ditta, Naples.—Cylindrical piano. 327

Engineering, Architecture, Maps, etc.

- 40 Linari, Eng. Antonio, Rome.—Plan for a tunnel. 330

Physical, Social, and Moral Condition of Man.

- 41 Acquadro, Paolo, Turin.—Postal box. 345
- 42 Aurineta, Cav. Marco Aurelio, Naples.—New system of disinfection. 346

BRAZIL.

(North of Nave, Columns 58 to 61.)

Publications, Scientific Instruments, Engineering.

Educational Systems, Methods, and Libraries.

- 1 Gaviae, Coronel.—Newspapers. 306
- 2 Barros, R. Paez de.—Newspapers. 306
- 3 Rezende, Luiz de.—Engravings and books. 306
- 4 Lenzinger.—Books. 306
- 5 Almeida, Lucio d'.—Books printed by the National Printing House of Rio de Janeiro. 306
- 6 National Industry Guide Society.—"The National Industry Guide Review." 306
- 7 The National Printing House, Rio de Janeiro.—Various typographical objects. 306

Scientific and Philosophical Instruments and Methods.

- 8 Province of Rio Grande do Sul.—Metal meridian. 320

- 9 Saldanha, Luiz de, Brazilian Navy.—Nautical repeating compass. 320
- 10 Garrid.—Apothecaries' scale. 322
- 11 General Commission from Rio de Janeiro.—Piano; large guitar (viola), and small guitars (machetes). 327
- 12 Lins, Lamenha.—Guitars. 327
- 13 Conceiro.—Violin and bow. 327
- 14 General Commission for Brazil.—Piano. 327

Engineering, Architecture, Charts, Maps, and Graphic Representations.

- 15 The Board of Directors of the "Pedro II Dock Works" Company.—Drawings showing the "Pedro II Dock Works" at Rio de Janeiro, and samples of the wood employed in the works, submarine constructions, wharves, and warehouses. 330
- 16 Garceix, Prof.—Geological map of the province of Minas-Geraes. 335

(For Naval Engineering, see Machinery Hall.)

ARGENTINE REPUBLIC.

(Nave to South Avenue, Columns 2 to 5.)

School Systems, Publications.

Educational Systems, Methods, and Libraries.

- 1 Calderon, Pedro, Province of San Juan.—Copies of Spanish grammar. 300
- 2 Uriarte, Miguel, Province of San Juan.
 - a A method of scholastic discipline. 300
 - b Educational statistics of the Province. 304
- 3 Government of the Province, Province of Catamarca.—Regulation and plan of teaching for public schools; Annals of Education; progress of education of the Argentine Republic. 304
- 4 Aguilera, Vicente Garcia, Province of Catamarca.—Reading cards. 304

- 5 Quiroga, Joaquin, Province of Catamarca.—Regulations for public libraries. 304
- 6 Provincial Commission, Province of Catamarca.—Rules of the Catamarca Club and public library. 304
- 7 Thriot, Luis F., Province of Córdoba.—Memoirs of the schools of the Province. 304
- 8 Provincial Commission, Province of Corrientes.—Statistics of the schools and libraries of the Province, compiled by the Board of Education. 304
- 9 De la Fuente, Diego G., Province of Buenos Ayres.—Copy of the first census of the Argentine Republic. 306

Publications, Institutions, Scientific Instruments.

- 10 Mullhall, N. G. & E. T., Province of Buenos Ayres.—Description of the Republic of La Plata; River Plate handbook. 306
- 11 Annals of Agriculture, Province of Buenos Ayres.—“Annals of Agriculture” of the Argentine Republic. 306
- 12 Napp, Ricardo, Province of Buenos Ayres.—“German Review.” 306
- 13 Provincial Commission, Province of Buenos Ayres.—Periodical publications. 306
- 14 Lequizamon, O., Minister of Public Education.—Works on science, education, law, politics, and finance, etc. 306
- 15 Espeche, Federico, Province of Buenos Ayres.—Book. 306
- 16 Barros, Col. Alvaro, Province of Buenos Ayres.—Books. 306
- 17 Kahl, Augusto, Province of Córdoba.—Books. 306
- 18 Espejo, Vicente, Alcalde, Province of Córdoba.—Book. 306
- 19 Thiriot, Luis F., Province of Córdoba.—Statistics of the Province, etc. 306

Institutions and Organizations.

- 20 Weyenbergh, H., Province of Buenos Ayres.—Periodical of the Argentine Zoological Society, etc. 311
- 21 Martin, Alfredo, Province of Córdoba.—Work on silver mining. 311
- 22 Moreno, Rudecindo R., Province of Entre-Ríos.—Archæological collection. 312
- 23 Provincial Commission, Province of Buenos Ayres.—Figures representing Argentine gauchos (peasants). 312

Scientific and Philosophical Instruments and Methods.

- 24 Cayol & Newmann, Province of Buenos Ayres.—Electric apparatus. 326
- 25 Milani, Francisco, Province of Buenos Ayres.—Guitars. 327
- 26 Bustini, Juan, Province of Buenos Ayres.—Violin. 327
- 27 Nuñez, Francisco, Province of Buenos Ayres.—Guitars. 327

Engineering, Architecture, Charts, Maps, and Graphic Representations.

- 28 Muratori, Col., Province of Buenos Ayres.—Spheric chart of the Rio de la Plata. 335
- 29 National Library, Province of Buenos Ayres.—Geographic chart of the Territory of Misiones; topographic plan of the Province of San Juan; plan of the Lac of Reloncavi; map of a portion of the Argentine Republic. 335
- 30 Topographic Department, Province of Buenos Ayres.—Maps, plans, etc. 335
- 31 Justo, A., Province of Entre-Ríos.—Chart of the Argentine Railroad of the East, with descriptive pamphlet. 335
- 32 Provincial Commission, Province of Córdoba.—Topographic map of the Province. 335
- 33 Government of the Province of Mendoza.—Topographic map of the Province. 335
- 34 Provincial Commission, Province of San Juan.—Topographic plans of the Province. 335
- 35 Mataso, Pedro, Chapo N., & Arrillaga J., Province of Corrientes.—Map of the Province, with a report. 335

Physical, Social, and Moral Condition of Man.

- 36 Provincial Commission of Corrientes.—Constitution, laws, organization of tribunals, regulations of police, rules of public schools, etc. 345
- 37 Provincial Commission, Province of Tucuman.—Works on law and religious topics. 345
- 38 Provincial Commission, Province of Salta.—Works on the constitution and regulations of the Province, official registry, messages. 345
- 39 Government of the Province of Catamarca.—Works on the constitution, laws, police, schools, tribunals, legislature, and ordinances. 345
- 40 Commission of the Province of Córdoba.—Compilation of laws, decrees, and reports of the chamber of justice. 345
- 41 Commission of the Province of Corrientes.—Summary of laws and duties of citizens, concerning popular education in the Province of Rio de la Plata. 348

ANNEX TO MAIN BUILDING.

Chemical Manufactures, Furniture.

Chemical Manufactures.

- 1 Rogers, Duck, & Lewis, Fort Wayne, Ind.—Miller's elastic surfacing liquid, applied to the bare wood of carriage and car bodies. 202

Furniture, etc.

- 2 Sharts, Theodore, New York N. Y.
 - a Family safes. 217
 - b Vault lights. 227
- 3 Pennsylvania Working Home for Blind Men, Philadelphia, Pa.—Mattresses. 217
- 4 Cutter, Ephraim, Cambridge, Mass.—Resting chair, fracture bed. 217
- 5 Houck, Sol. J., & Co., Dayton, Ohio.—Coffee pots and urn. 218
- 6 Thomas, Roberts, Stevenson, & Co., Philadelphia, Pa.—Coal and wood stoves, hot-air furnaces, cooking ranges. 222
- 7 Burnham, Chas., & Co., Philadelphia, Pa.
 - a Gas cooking and heating stoves. 222
 - b Weather strips. 227
- 8 Cooley, J. G., Hyde Park, Mass.—Lamp cooking apparatus. 222
- 9 Mershon's, Dan'l, Sons, Philadelphia, Pa.—Heaters for gas, steam, and hot water; gas logs. 222
- 10 Orr, Painter, & Co., Reading, Pa.—Ranges, heaters, stoves. 222
- 11 Spear, James, & Co., Philadelphia, Pa.—Stoves, heaters, ranges, low-down grates, etc. 222
- 12 Reid & Cooper, Elmira, N. Y.—Cooking stove. 222
- 13 Swett, Quimby, & Perry, Troy, N. Y.—Parlor stove, cooking and heating ranges. 222
- 14 Thomas & Joerns, New York, N. Y.—Base-feeding parlor coal vases, movable base-feeding coal bins. 222
- 15 McDougall, S. T., New York, N. Y.—Gas stoves and cabinets, petroleum stoves, cooking apparatus, oil lamps and fixtures, gas burners. 222
- 16 Paris, Dan'l E., & Co., Troy, N. Y.—Ranges, parlor cook-stove, heater. 222
- 17 Dunglison, Richard J., Philadelphia, Pa.—Corn-grater. 222
- 18 Leibrandt & McDowell Stove Co., Philadelphia, Pa.—Stoves, etc. 222
- 19 Bentley, Jeffrey O., Philadelphia, Pa.—Hollow metallic steam-radiating base-board for heating rooms. 222
- 20 Dripps, Isaac, Philadelphia, Pa.—Safety ventilating heaters for railroad passenger cars. 222
- 21 Stuart, Peterson, & Co., Philadelphia, Pa.—Stoves, hollow ware, and hardware goods. 222
- 22 Perkins & McFarland, Philadelphia, Pa.—Heaters and ranges. 222
- 23 Reynolds, J., & Son, Philadelphia, Pa.—Wood and coal furnaces, cooking range. 222
- 24 Hall, John D., Brooklyn, N. Y.—Furnace. 222
- 25 Morris & Haines, Philadelphia, Pa.—Heaters and range. 222
- 26 Burtis & Graff, New York, N. Y.—Furnaces, Baltimore heater. 222
- 27 Hayes, Coulter, & Co., Philadelphia, Pa.—Hot-air furnace, cooking range. 222
- 28 Grossius, John, Cincinnati, Ohio.—Stove for school-houses, etc. 222
- 29 Barry & Lane, New York, N. Y.—Oven range and cast-iron setting. 222
- 30 Creamer, Wm. G., & Co., New York, N. Y.—Railway car ventilators, lamps, and car trimmings; house registers. 222
- 31 Nixon, George, & Son, Philadelphia, Pa.—Hotel range and boiler. 222
- 32 Bartlett, Job, & Sons, Philadelphia, Pa.—Furnaces, kitcheners, low grates. 222
- 33 Gale, D. A. T., Syracuse, N. Y.—Metallic bed bottom. 222
- 34 Barstow Stove Co., New York, N. Y.—Stoves, ranges, furnaces, heaters, hollow ware, etc. 222
- 35 Hopkin, William, jr., Philadelphia, Pa.—Furnace, range, and boilers. 222
- 36 Lotz, Wm. H., Chicago, Ill.—Furnaces. 222
- 37 Sheppard, Isaac A., & Co., Philadelphia, Pa.—Stoves, ranges, furnaces, hollow ware. 222
- 38 Thomson, Edward, Philadelphia, Pa.—Hotel cooking range, brick and portable furnaces. 222
- 39 Tuttle & Bailey Manufacturing Co., New York, N. Y.—Hot-air registers, ventilators, ornamental screens for steam coils, etc. 222
- 40 Resor, Wm., & Co., Cincinnati, Ohio.—Cooking stoves. 222
- 41 Caldwell & Mather, Philadelphia, Pa.—Cooking ranges and heating furnace. 222

Heaters, Stoves, Household Utensils.

- 42 J. L. Mott Iron Works, New York, N. Y.—Ranges, heaters, stoves, and grates. 222
- 43 McCoy & Roberts, Philadelphia, Pa.—Portable hot-air furnaces. 222
- 44 Barker, Geo. R., Philadelphia, Pa.—Combined heating and ventilating flue apparatus and double register. 222
- 45 Gold's Heater Co., New York, N. Y.—Heaters. 222
- 46 Williams, Charles, & Co., Philadelphia, Pa.—Heaters, ranges, ventilators. 222
- 47 Rathbone, Sard, & Co., Albany, N. Y.—Stoves and ranges for coal or wood. 222
- 48 Abendroth Bros., New York, N. Y.—Stoves, ranges, plumbers' ironware, vases, fountains, hot-house and stable fittings. 222
- 49 Taplin, Rice, & Co., Adron, Ohio.—Base-burning and cooking stoves. 222
- 50 Giles, H. G., & Son, Troy, N. Y.—Portable furnace and range, and parlor stoves. 222
- 51 Myers, George, Philadelphia, Pa.—Bath boilers and tanks. 222
- 52 Whitehead, Thomas J., South Paris, Me.—Combined cooking stove and hot-air furnace. 222
- 53 Chatain, Henry. Washington, D. C.—Baking oven. 222
- 54 National Stove Works, New York, N. Y.—Heaters and ranges. 222
- 55 Doyle, William, Albany, N. Y.—Stoves, furnaces, and ranges. 222
- 56 Comstock, Castle, & Co., Quincy, Ill.—Heating stove. 222
- 57 Keystone Hardware Manufacturing Co., Reading, Pa.—Hardware, apple parers, fruit presses, hot-air registers, and ventilators. 222
- 58 Detroit Stove Works, Detroit, Mich.—Cooking and coal and wood heating stoves. 222
- 59 Johnson, Black, & Co., Erie, Pa.—Stoves, furnaces, and heaters. 222
- 60 Mitchell, Stevenson, & Co., Pittsburgh, Pa.—Stoves. 222
- 61 Hessenbruch, Thomas, Philadelphia, Pa.—Combination damper and ventilator. 222
- 62 Michigan Stove Co., Detroit, Mich.—Stoves, hollow ware, stove furniture, etc. 222
- 63 Lesley, Alex. M., New York, N. Y.—Refrigerators and coolers, gothic furnace. 222
- 64 March, Brownback, & Co., Limerick Station P. O., Pa.—Heaters, ranges, and hollow ware. 222
- 65 Boyd, David, New York, N. Y.—Flue radiator, flue and diaphragm attachment. 222
- 66 New Haven Steam-Heating Co., New Haven, Conn.—Radiators and screens for low-pressure steam-heating. 222
- 67 Miller, Joseph A., Providence, R. I.—Hose carriage, models for locomotive boilers. 222
- 68 Corey, Jas. H., New York, N. Y.—Culinary boiler and steam and exhaust valve combined. 222
- 69 Duparquet, L. F., & Huot, New York, N. Y.—Ranges, broilers, coffee and tea urns, cooking utensils. 222
- 70 Willoughby, James D., Philadelphia, Pa.—Cook stove and ovens. 222
- 71 Shepherd, Chas. H., Philadelphia, Pa.—Refuse of cork prepared for kindling fires. 222
- 72 Belson, R. W., Philadelphia, Pa.—Warm-air furnace. 222
- 73 Williams & Co., Nashua, N. H.—Stoves, washtrays, sinks, griddles etc., of Francetown soapstone. 222
- 74 Mears, Olhaber, & Co., Cincinnati, Ohio.—Cooking stoves. 222
- 75 Littlefield Stove Manufacturing Co., Albany, N. Y.—Base-burner stoves, ranges, furnaces. 222
- 76 Ferris, Geo. H., New York, N. Y.—Domestic boiler, coffee still. 222
- 77 Gardner, M. H., Green Island, N. Y.—Combination knobs for stoves, ranges, etc. 222
- 78 Birkey, John Q., & Co., Philadelphia, Pa.—Gas heaters. 222
- 79 Spicers & Peckham, Providence, R. I.—Ranges, parlor stoves. 222
- 80 Masser, H. B., Sunbury, Pa.—Coffee roaster. 222
- 81 Garrison, W. S., Volga City, Iowa.—Tubular heating stove. 222
- 82 Magee Furnace Co., Boston, Mass.—Furnace, ranges, parlor stoves. 222
- 83 Read, Josiah M., Boston, Mass.—Cooking range, stove dampers, liters, and broilers. 222
- 84 Barrows, Savery, & Co., Philadelphia, Pa.—Hollow ware, irons, porcelain refrigerator, etc. 224
- 85 Farson, E. S., & Co., Philadelphia, Pa.—Refrigerators and coolers. 224
- 86 Gravenstine, John, Philadelphia, Pa.—Sideboard, refrigerator, and water-cooler combined. 224
- 87 Soggs, C. W., Carbondale, Pa.
a Fruit and vegetable parer and slicer. 224
b Folding adjustable ironing table and skirt-board. 225
- 88 Lacy, Walter, Milwaukee, Wis.—Steamless cooking shell. 224
- 89 Redington, J. C. O., Batavia, N. Y.—Revolving broilers. 224
- 90 Kimball, Wm. S., Philadelphia, Pa.—Refrigerator, filter, and cooler. 224
- 91 Parker, Chas., Meriden, Conn.—Coffee mills. 224
- 92 Berney, Alfred, Boston, Mass.—Teakettle, boiler, and steamer; dry, wet, and weighing measure combined; coffee cone. 224
- 93 Patent Keg Co., Philadelphia, Pa.—Paint and other cans. 224
- 94 Keller Manufacturing Co., Harrisburg, Pa.—Graduated quart measure. 224
- 95 Hess, Abram, Philadelphia, Pa.—Cooking apparatus. 224
- 96 Saffel & Baldwin, Tiffin, Ohio.—Churns, wood faucets, grooved washboards. 224

Household Utensils.

- 97 Shepard, Sidney, & Co., Buffalo, N. Y.—Japanned and stamped tinware, coal vases, stove boards, ice cream freezers, spice caddies. 224
- 98 Stites & Co., Cincinnati, Ohio.—Iron measures, buckets, and paint pails. 224
- 99 Broch, Isidor, Philadelphia, Pa.—Water filter. 224
- 100 Acquackanonk Manufacturing Co., Passaic, N. J.—House furnishing woodenware; stepladders, hat racks, knifeboards, etc. 224
- 101 Rohrer, Jeremiah, Lancaster, Pa.—Refrigerator and water cooler combined. 224
- 102 Weare Bros. & Co., Cincinnati, Ohio.—Inodorous stoveware. 224
- 103 Ford, F. G., Philadelphia, Pa.—Flour and ash pails and sieves combined; toys. 224
- 104 Byrne, Wm. F., Marianna, Ark.—Bar or club room refrigerator. 224
- 105 Polhemus, J. H., New York, N. Y.—Refrigerating cupboard, upright and chest refrigerator. 224
- 106 Newark Tea Tray Co., Newark, N. J.—Tea trays, children's trays, stove platforms, dustpans, and brushes. 224
- 106^a Cass, W. E., Newark, N. J.—Carving fork. 224
- 107 Bassett, Nathan, Philadelphia, Pa.—Flour sifter for bakers, grocers, and flour dealers. 224
- 108 Allegretti Refrigerator Co., New York, N. Y.—Refrigerators, railroad refrigerator car, undertakers' preserving casket. 224
- 109 Monroe, Edwin P., Newark, N. J.—Kitchen hardware, eggbeaters, apple parers, etc. 224
- 110 Olmsted, S., jr., Galesburg, Ill.—Sifter, cullender, and strainer combined. 224
- 111 Silver, W. H., New York, N. Y.—Egg beater, tin churns, and ice cream freezers. 224
- 112 Consolidated Fruit Jar Co., New Brunswick, N. J.—Fruit in Mason's glass jars. 224
- 113 Scheider, J., & Co., Portland, Conn.—Stamped and japanned ware; house furnishing goods. 224
- 114 Cull, Henry, Philadelphia, Pa.—Combination sink and dish cupboard and toilet stand; kitchen and dining room furniture. 224
- 115 Missouri Valley Novelty Works, St. Joseph, Mo.—Combination kitchen safe. 224
- 116 Simes & Tate, Philadelphia, Pa.—Water filter. 224
- 117 Randle, Wm. H., Baltimore, Md.—Water coolers and refrigerators. 224
- 118 Hubbard, John, Detroit, Mich.—Small pails. 224
- 119 Sawyer, Geo. F., Albion, N. Y.—Coal scuttle. 224
- 120 Putnam, George W., Billerica, Mass.—Spice box. 224
- 121 Wilson Manufacturing Co., Philadelphia, Pa.—Clothes dryer, rack, nursery cup. 224
- 122 Rasin, William J., Philadelphia, Pa.—Water coolers, restaurant coolers. 224
- 123 Hagner Drug Milling Co., Philadelphia, Pa.—Aerial refrigerating case. 224
- 124 Union Manufacturing Co., Toledo, Ohio.—Washboards, churns, lawn hose carts, kitchen woodenware. 224
- 125 Vignal, Carl, New York, N. Y.—Ice cream refrigerator. 224
- 126 Troy Stamping Works, Troy, N. Y.—Tin and sheet iron goods. 224
- 127 Schaum, John P., Lancaster, Pa.—Copper kettles and copper ware. 224
- 128 St. Louis Stamping Co., St. Louis, Mo.—Granite iron cooking and household utensils. 224
- 129 Hall, H. H., Tioga, Pa.—Dish-washing machine. 224
- 130 Bollenbacher, Geo. W., Bloomington, Ind.—Kneading table, with flour and meal chest combined. 224
- 131 Colton, E. S., Boston, Mass.—Refrigerators, water coolers, dry sink, ice cream refrigerator. 224
- 132 Gem Soldering Iron Co., Philadelphia, Pa.
a Soldering casket. 224
b Portable shower bath. 226
- 133 Skinner, Taber, Philadelphia, Pa.—Combined steam washer and boiler stove. 225
- 134 Moore, Henry, & Son, Philadelphia, Pa.—Washing machine. 225
- 135 Dugdale, Jas. K., White Waters, Ind.—Clothes wringers and washers, garden cultivators. 225
- 136 American Machine Co., Philadelphia, Pa.—Clothes wringers, fluters. 225
- 137 Chalfant Manufacturing Co., Philadelphia, Pa.—Sad irons, polishing, laundry, and tailors' irons. 225
- 138 Vant, Aremas B., and Cheney, Henry O., Hopkinton, Mass.—Washer and wringer combined. 225
- 139 American Lever Wringer Co., Springfield, Ohio.—Clothes wringer. 225
- 140 Applegate, Robert O., Philadelphia, Pa.—Ironing table. 225
- 141 Tittsworth, E. B., Plainfield, N. J.—Washer. 225
- 142 Worden, A. E., Smyrna, Del.—Washing machine. 225
- 143 Colby Wringer Co., Waterbury, Vt.—Clothes wringer, little washer. 225
- 144 Bless & Drake, Newark, N. J.—Self-heating smoothing irons, tailors' geese, sad, laundry, and polishing irons. 225
- 145 Sterling, Mrs. Charlotte H., Gambier, Ohio.—Dish washer and self-dryer. 225
- 146 Calver, Dr. G. W. H., Columbus, N. J.—Household ironing machine. 225
- 147 Bailey Wringing Machine Co., New York, N. Y.—Clothes wringers. 225
- 148 White, William, Newark, N. J.—Washing machines. 225
- 149 Jennings, A. W., Bedford, Ohio.—Clothes washers. 225
- 150 Gove, John C., Cleveland, Ohio.—Fruit and provision preserving house, washing machine, adjustable index writer. 225

Household Utensils, Carriage Hardware.

- 151 Lash, J. S., & Co., Philadelphia, Pa.—Washing machine, bench wringers. 225
- 152 Valley, J. N., North East, Pa.—Clothes horse, step and extension ladder, washing machine, folding table. 225
- 153 Duff, P., & Sons, Pittsburgh, Pa.—Washboard. 225
- 154 Lamb, Geo. D., New Haven, Conn.—Little washer, iron holder. 225
- 155 Metropolitan Washing Machine Co., New York, N. Y.—Clothes wringers, washing machine, mangle. 225
- 156 Monitor Manufacturing Co., Syracuse, N. Y.—Washing machine. 225
- 157 Myers, A. G., New York, N. Y.—Water closets and plumbers' material. 226
- 158 Blessing, C. A., Philadelphia, Pa.—Bath tubs, washstand, bidet. 226
- 159 Carr, Wm. S., & Co., New York, N. Y.—Water closets, brass pumps, cabinet woodwork, and bathroom. 226
- 160 Wakefield Earth Closet Co., New York, N. Y.—Earth closets, combined commode and slop pail. 226
- 161 Carrigan, Peter, Philadelphia, Pa.—Copper bathtubs, footbath, and pantry sink. 226
- 162 Weaver & Pennock, Philadelphia, Pa.—Marble lavatory. 226
- 163 Vinton, C., Hartford, Conn.—Babies' bathtub, sitz bath. 226
- 164 Bacharach, M., New York, N. Y.—Street urinal. 226
- 165 Travis, Jos. L., Philadelphia, Pa.—Water closets, brass and plated work for plumbers and steam fitters. 226
- 166 Steeger, Henry, New York, N. Y.—Copper boilers, bathtubs, etc. 226

Metallic Products.

- 167 Brooks & Patton, Columbus, Ohio.
a Hollow ware. 283
b Pump cylinders, plumbers' ware, etc. 284
- 168 Rowland, William & Harvey, Philadelphia, Pa.—Carriage, locomotive, and car springs; tire, sheet, cast, machinery, and blister steel. 284
- 169 Burwell, William, & Brother, Philadelphia, Pa.—Carriage mountings in silver, oricid, and gold plated. 284
- 170 The Philadelphia Axle Co., Philadelphia, Pa.—Iron and steel axles, improved wheels. 284
- 171 Hoopes, Bro., & Darlington, West Chester, Pa.—Wheels, hubs, spokes, bent felloes, shafts, and handles. 284
- 172 Topliff & Ely, Elyria, Ohio.—Tubular bow, shaft, and pole sockets for carriages; side-spring equalizers. 284
- 173 Kent, D. H., & Co., Wilmington, Del.—Iron hardware and coach material. 284
- 174 Benezet & Co., Philadelphia, Pa.—Carriage and wagon springs. 284
- 175 Dann, Bros., & Co., New Haven, Conn.—Carriage woodwork. 284
- 176 Shields, Thomas, Philadelphia, Pa.—Bolts, carriage clips, nuts, washers, etc. 284
- 177 Kunzig, Christian, Philadelphia, Pa.—Gold and silver carriage mountings. 284
- 178 Metal Stamping Co., New York, N. Y.—Carriage curtain loops and buckles, knob fasteners, etc. 284
- 179 Brown, S. N., & Co., Dayton, Ohio.—Sulky, buggy, and coach wheels, hubs, spokes, bows, shafts, poles, and yokes. 284
- 180 Dexter Spring Co., Hulton, Pa.—Vehicle springs. 284
- 181 Scidler, Fred., Mechanicsburg, Pa.—Spokes, felloes, hubs, shafts, poles, bows, wheels. 284
- 182 Sheldon & Co., Auburn, N. Y.—Carriage and wagon axles. 284
- 183 McKnight & Rohrer, Charleston, W. Va.—Carriage rims; axe, pick, sledge, hammer, and hatchet handles. 284
- 184 Advena & Heald, Philadelphia, Pa.—Carriage and wagon axles; steel boxes. 284
- 185 Ayers, Root, & Co., Sidney, Ohio.—Buggy and wagon spokes. 284
- 186 Cowles, C., & Co., New Haven, Conn.—Carriage trimmings and hardware. 284
- 187 New Haven Wheel Co., New Haven, Conn.—Wheels for vehicles. 284
- 188 Davis, John G., & Son, Philadelphia, Pa.—Spokes, hubs, rims, wheels, and plow handles. 284
- 189 Sandusky Wheel Co., Sandusky, Ohio.—Carriage woodwork. 284
- 190 Woolworth, James, Sandusky, Ohio.—Tool handles. 284
- 191 Smith, H. D., & Co., Plantsville, Conn.—Carriage and coachmakers' forged hardware. 284
- 192 Urmston, John, Rahway, N. J.—Hubs. 284
- 193 Crane, Saml. O., Newark, N. J.—Carriage wheels. 284
- 194 Jones, Phineas, & Co., Newark, N. J.—Coach and carriage wheels, spokes, hubs, rims, etc. 284
- 195 Kilburn, Isaac B., Newark, N. J.—Bent carriage woodwork and materials. 284
- 196 Smith, Alfred E., Brownville, N. Y.—Carriage axles. 284
- 197 Searls, Anson, Newark, N. J.—Top prop for carriages, whip sockets. 284
- 198 Union County Manufacturing Co., Elizabeth, N. J.—Wheels and wheel stock. 284
- 199 Skelly, Thomas, Philadelphia, Pa.—Carriage bolts, axle clips, nuts, etc. 284
- 200 Lockwood, C. N., & Co., Newark, N. J.—Carriage lamps and plated carriage ware. 284
- 201 Silas, Rogers, & Co., Stanfordsville, N. Y.—Carriage and truck axles. 284
- 202 Springer, Morley, & Gause, Wilmington, Del.—Coach and carriage wheels, hubs, spokes, and felloes. 284
- 203 Baker & Co., Waller, Ohio.—Wheels, hubs, spokes, felloes gearing, wood in rough, etc. 284

Carriage Hardware, Vehicles.

- 204 Sippel, Chr., Newark, N. J.—Fancy turning for carriage trimmings. 284
- 205 Dalyell, D., & Sons, South Egremont, Mass.—Carriage axles, axle boxes. 284
- 206 Ohio Wheel Co., Delphos, Ohio.—Spokes, hubs, carriage and wagon bent work. 284
- 207 Olds, N. G., & Sons, Fort Wayne, Ind.—Wheels, hubs, buggy seats, and plow handles. 284
- 208 Leippe, Jacob A., Anchor Bending Works, Lancaster, Pa.—Shafts and rims. 284
- 209 Fort Plain Spring and Axle Works, Fort Plain, N. Y.—Carriage and wagon axles and springs. 284
- 210 Logansport Manufacturing Co., Logansport, Ind.—Wagon and carriage spokes, bent felloes, shafts, and soles. 284
- 211 Cunningham, Portz, & Co., Fostoria, Ohio.—Spokes, felloes, neck yokes, whiffletrees, pick and hammer handles, etc. 284
- 212 Strahorn, Pierson, & Co., Toughkenamon, Pa.—Carriage wheels. 284
- 213 Lebzelter, Philip, Lancaster, Pa.—Spokes, felloes, shafts. 284
- 214 Paine Brothers, New York, N. Y.—Hickory and ash handles, carriage and wagon woodwork, hardwood lumber. 284
- 215 Case, W. V., Bro., & Co., Stockton, N. J.—Spokes, whiffletrees, neck yokes, handles, and carriage woodwork. 284
- 216 Woodburn Sarven Wheel Co., Indianapolis, Indiana.—Sarven and common wood hub wheels. 284
- 217 Frohock, Wm. Thompson, Philadelphia, Pa.—Suspension steel buggy wheels, nickel-plated spokes, etc. 284
- 218 Hayden & Smith, Auburn, N. Y.—Hardware and finished forgings for carriages. 284
- 219 Mosier, John L. H., New York, N. Y.—Ironwork for pleasure carriages and tools for carriage smiths. 284
- 220 Welsh & Lea, Philadelphia, Pa.—Carriage and tire bolts, nuts, axle clips, etc. 284
- Carriages, Vehicles, and Accessories.**
- 221 Rogers, Wm. D., & Co., Philadelphia, Pa.—Pleasure carriages. 292
- 222 Beckhaus, Jos., Philadelphia, Pa.—Coach, landaulet, phaeton, coupé. 292
- 223 McLear & Kendall, Wilmington, Del.—Phaetons, rockaway, family, park, and seaside carriages. 292
- 224 Petry, Geissel, Bayha, & Co., Philadelphia, Pa.—Finished and unfinished landaus. 292
- 225 Jacobs, S. W., & Son, Philadelphia, Pa.—Pleasure carriages. 292
- 226 Childs, Geo. K., Philadelphia, Pa.—Shifting top buggy, track sulky. 292
- 227 Lane, D. M., & Son, Philadelphia, Pa.—Extension top brett, phaeton, falling top buggy. 292
- 228 Haskell Bros., Philadelphia, Pa.—Road top wagon. 292
- 229 Brewster & Co., of Broom street, New York, N. Y.—Town and park carriages, road wagons, and sleighs. 292
- 230 Wood Brothers, New York, N. Y.—Brougham, vis-a-vis, top wagon, landau, T and dog cart. 292
- 231 Moore, J. P., Fremont, Ohio.—Shifting seat buggy. 292
- 232 Caffrey, Chas. S., Camden, N. J.—Skeleton sulky, shifting top buggy, phaetons. 292
- 233 Wright & Shinick, Oyster Bay, N. Y.—Light road wagon. 292
- 234 Brewster, J. B., & Co., 25th street, New York, N. Y.—Landau town coach, demi-landau, coupé, victoria, windsor wagons. 292
- 235 Miller Carriage Co., Bellefontaine, Ohio.—Carriage and buggy combined. 292
- 236 Stivers, Rufus M., New York, N. Y.—Pleasure carriages or buggies. 292
- 237 Bailey & Wilson, Oxford, Pa.—Trotting wagon. 292
- 238 Studebaker Bros. Manufacturing Co., South Bend, Ind.—Top buggy. 292
- 239 Hare, W. S., Philadelphia, Pa.—Light phaeton, unpainted. 292
- 240 Hetfield & Jackson, Rahway, N. J.—Light pleasure carriages. 292
- 241 Cadwallader, Fitz Gibbon, & Co., Trenton, N. J.—Road wagon, top buggy. 292
- 242 Rech, Jacob, Philadelphia, Pa.—Phaetons, top buggy, Jenny Lind. 292
- 243 Scranton, L. S., Grand Rapids, Mich.—Track sulky, buggy. 292
- 244 Marsh, Ezra, Newark, N. J.—Brougham, phaetons, buggy. 292
- 245 Colyer, J., & Co., Newark, N. J.—Westchester, rockaway, top buggy, road wagon. 292
- 246 Randall, Jas. V., Newtown, Pa.—Extension phaetons. 292
- 247 Guthrie, Jones, & Co., Wilmington, Del.—Buggies. 292
- 248 Cunningham, James, & Son, Rochester, N. Y.
a Landaus, landaulet, top buggy. 292
b Hearses. 293
- 249 Gosling, J. W., Cincinnati, Ohio.—Brett carriage, top buggies, side bar wagon. 292
- 250 Renick, Curtis, & Co., Greencastle, Ind.—Combined carriage and buggy; combined carriage and buggy bodies. 292
- 251 Wright, W. H., & Co., Wilmington, Del.—Double jump seat carriage. 292
- 252 Allgaier, John, Philadelphia, Pa.—Falling-top buggy drag. 292
- 253 Hall, James, & Son, Boston, Mass.—Berlin coach; top and shifting top buggies. 292
- 254 Enders, J., & Co., Louisville, Ky.—Top buggy with side bar attachment. 292
- 255 Sargent & Ham, Boston, Mass.—Extension top park phaeton. 292
- 256 Scovill, S. S., & Co., Coniwater, Mich.—Box buggy and track sulkies. 292
- 257 McDermott, John, & Bros., Washington, D. C.—Shifting top buggy. 292

Carriages, Sleighs, Railroad Cars.

- 258 Green, John, Wilmington, Del.—
Jump seat and doctors' rockaways. 292
- 259 McLear, Alfred, West Chester,
Pa.—Shifting seat carriage and shifting
top buggy. 292
- 260 Gilman, F. C., Montpelier, Vt.—
Track sulky, open wagon. 292
- 261 Rodgers, S. C., Philadelphia, Pa.
—Shifting top, side bar wagon; one-man
wagon. 292
- 262 Gregg & Bowe, Wilmington, Del.
—Carriages. 292
- 263 Behlen, Charles, Cincinnati,
Ohio.
a Barouche, physicians' phaeton. 292
b Hearse. 293
- 264 Tonsend, Chas. T., New Haven,
Conn.—Phaeton, road wagon, and willow
shell bodies. 292
- 265 King, H., & Co., New Haven,
Conn.—Pleasure carriages. 292
- 266 Manville, B., & Co., New Haven,
Conn.—Rockaways, cabriolet, T cart. 292
- 267 Hub Publishing Co., New York,
N. Y.—Hand drawings of carriages. 292
- 268 Grube, Chas., New York, N. Y.—
Park phaeton, top buggy. 292
- 269 Goold, James, & Co., Albany, N. Y.
a Drawing-room coach, buggy. 292
b Sleighs, cutter. 295
- 270 Stone, Frank P., Chicago, Ill.—
Porter buggy. 292
- 271 Pray Brothers, Boston, Mass.—
Goddard buggy, track sulky. 292
- 272 Packard, C. F., & Co., West Farm-
ington, Maine.—Side spring platform
wagon, and track wagon. 292
- 273 Sargent, William P., & Co., Bos-
ton, Mass.
a Buggies, carriages. 292
b Sleighs. 295
- 274 Smith, J. T., & Co., Boston, Mass.
a Top buggies. 292
b Sleighs. 295
- 275 Durham & Wooster, New Haven,
Conn.—Landulet couplet, London phaet-
on. 292
- 276 Dibble, C. F., & Co., Philadelphia,
Pa.—Doctors' gig, pony phaeton. 292
- 277 St. James C., Pittsfield, Mass.—
Single carriage, thill and pole. 292
- 278 Shaw Carriage Co., Indianapolis,
Ind.—Open buggy and buggy gearing. 292
- 279 Jones, Phineas, & Co., Newark,
N. J.—Track sulky. 292
- 280 Tibbals, Lewis P., New York, N.
Y.—Baby carriage. 293
- 281 Shill, Harry J., jr., Philadelphia,
Pa.—Baby and toy carriages. 293
- 282 Conover, J. A., & Son, New York,
N. Y.—Spring leaping-horses, baby car-
riages. 293
- 283 Yost, T. A., Philadelphia, Pa.—
Children's carriages and velocipedes. 293
- 284 Swope, Coxson, & Bro., Philadel-
phia, Pa.—Children's carriages. 293
- 285 Montpelier Manufacturing Co.,
Montpelier, Vt.—Children's carriages. 293
- 286 McIntire, J. Frank, Boston, Mass.
—Children's carriages. 293
- 287 Cole & Ballard, Newark, N. J.—
Baby carriages, velocipede, sled, and
wagon. 293
- 288 Newgeon & Shelton Carriage
Co., Birmingham, Conn.—Children's
carriages. 293
- 289 Steinbach, Geo. P., Baltimore,
Md.—Children's convertible sleeping
coaches and walking and nursery chair
and vehicle. 293
- 290 Fraley, G. W., & Co., Philadel-
phia, Pa.—Canopy-top baby coach, velo-
cipede. 293
- 291 Palmer, James, Brooklyn, N. Y.
—Children's carriages. 293
- 292 McIntire, Samuel, New York, N.
Y.—Baby carriages. 293
- 293 Baerresen, H. W., & Co., Louis-
ville, Ky.—Children's carriages. 293
- 294 Youle, William, Norwalk, Conn.
—Hearses. 293
- 295 Paris Hill Manufacturing Co.,
Paris Hill, Me.—Children's carriages and
sleds. 293
- 296 Hunt, Wm., Camden, N. J.—Pas-
senger vehicles. 293
- 297 Pickering, Thos. R., Portland,
Conn.—Velocipede. 293
- 298 Abbott, A. A., & Co., Chicago, Ill.
—Sleighs with metallic knees. 295
- 299 Smith, Hugh, Gray, Me.—Double
and single sleighs. 295
- 300 Russell, Joseph, Portland, Me.—
Single sleighs. 295
- 301 Pennsylvania Working Home for
Blind Men, Philadelphia, Pa.—Har-
ness. 296
- 302 Dohan, J. F., & Co., Binghamton,
N. Y.—Carriage curtain-lights and other
stamped carriage goods. 296
- 303 Baldwin, Jos., & Co., Newark, N.
J.—Saddlery hardware, hand forged and
malleable; bits. 296
- 304 Hayden & Smith, Auburn, N. Y.
—Hames and trimmings for harness. 296

Railway Plant, Rolling Stock, and
Apparatus.

- 305 Jackson & Sharp Co., Wilmington,
Del.—Ordinary and narrow gauge passen-
ger cars. 571
- 306 Harlan & Hollingsworth Co., Wil-
mington, Del.—Parlor car, narrow gauge
passenger car. 571
- 307 Haase, John A., Philadelphia, Pa.
—Model freight car, hose shield, floor and
door clamps, ratchet drills. 571
- 308 Pullman's Palace Car Co., Chicago,
Ill.—Drawing-room car, hotel car. 571
- 309 Wason Manufacturing Co., Spring-
field, Mass.—Railway passenger car. 571
- 310 La Mothe Manufacturing Co., New
York, N. Y.—Steel car, metallic chairs
and bedstead, model of metallic bridge,
boat, building, etc. 571
- 311 Hayden, James, Philadelphia, Pa.
—Car model, showing improvement in
bumper springs, platform and draw
heads. 571

Railroad Cars and Appliances.

- | | |
|--|---|
| <p>312 Ustick, Stephen, Philadelphia, Pa.
—Car model, showing improved coupling
and journal lubricators. 571</p> <p>313 Stephenson, John, & Co., New
York, N. Y.—One and two horse street
cars. 571</p> <p>314 Towle Manufacturing Co., New
York, N. Y.—Bell punches and fare regis-
ters. 571</p> <p>315 Darling, Saml., Providence, R. I.
—Improved car window. 573</p> <p>316 Brill, J. G., & Co., Philadelphia,
Pa.—Street railway car. 577</p> <p>317 Morgan, Richard Price, jr., Bloom-
ington, Ill.—Elevated railway for cities,
adopted by the Rapid Transit Commission
of New York, Oct. 4, 1875. 577</p> | <p>318 Jones, J. M., & Co., West Troy,
N. Y.—Street and excursion street
cars. 577</p> <p>319 Williams, R. L., Middle Granville,
N. Y.—Self-coupler for cars. 577</p> <p>320 Schopp, Phil. J., Louisville, Ky.—
Pneumatic screw ventilator. 577</p> <p>321 Crocker, L. O., East Braintree,
Mass.—Conductors' railway ticket
punches. 577</p> <p>322 Eckel, Herman, Cincinnati, Ohio.
—Enameled iron hollow ware. 283</p> <p>323 Providence Tool Co., Providence,
R. I.—Hardware, nuts, washers, etc. 284</p> <p>324 Seward, M., & Son, New Haven,
Conn.—Carriage hardware. 284</p> |
|--|---|

INDEX OF EXHIBITORS.

DEPARTMENTS I., II., III.

- Aalborg Chemical Works, 239, 210.
 Aalborg Syrup & Spirit Factory, 210.
 Aarestrup, J., Piano, 291.
 Aargan, Canton, Build. Direction, Plans, 284.
 Aargan Reformatory, Reports, 285.
 Abbey, C., & Sons, Gold Foil, 134.
 Abbott, A. A., Sleighs, 300.
 Abbott Pavement Co., 18.
 Abegglen, Perrin, Chalets, 285.
 Abenroth Bros., Stoves, 296.
 Aboriginal Mission Station, Hops, 156.
 Abplanalp, J., Casings, 285.
 Abraham, A., Pupils' Work, 289.
 Abraham's Bros., Books, 206.
 Aby Stock Co., Yarns, 212.
 Acadia Catharine Gold Mining Co., 35.
 Accarise, G., Jewelry, 219.
 Acgnadro, P., Postal Box, 292.
 Ackens, Grand, Ry, & Co., Clothing, 189.
 Ackerly, J., Spar, 45.
 Acosta de Quirolo, I., Rock, 99.
 Acton, 223.
 Acquackanauk Mnfgr. Co., Wooden Ware, 297.
 Adams & Co., Glass Ware, 113.
 Adams & Co., Knitting Silks, 147.
 Adams, E. A., & Son, Trunk Covers, 131.
 Adams, J., Polishes, 142.
 Adametz, J., Garnet Goods, 195.
 Adams, J., Wheat, 156.
 Adams, J. H., Silver Ore, 13.
 Adams, J. H., & Co., Shell Jewelry, 128.
 Adams, R., Hinges, 149.
 Adams, R. T., Filters, 153.
 Adams White Lead Co., 110.
 Adams, W. M., Problems, 263.
 Adank, J. J., & Co., Musical Box, 283.
 Adberg, C. R., Boots, 213.
 Addis, J. B., & Sons, Tools, 149.
 Addick & Stevens, Table, 115.
 Adelaide Museum, Birds, etc., 162.
 Adelsvård, Baron T., Ore, 84; Copper, 85.
 Adjustable Folding Chair Co., 113.
 Adler, G., Paper Box, 191.
 Adler, R., Musical Instruments, 278.
 Adlischwell Silk Goods Factory, 199.
 Advena & Heald, Axles, 298.
 Aebi & Landry, Watches, 282.
 Agnew, D. F., Crucibles, 18.
 Agosti, A., Paper, 219.
 Agosti Bros., Olive Oil, 217.
 Agrarian Com. for 30 Exhib., Olive Oil, 217.
 Aguilar, F., Medicinal Herbs, 250.
 Aguilar, F. D., Minerals, 99; Lime, 100.
 Aguilera, V. G., Reading Cards, 293.
 Ahlberg & Ohlsson, Æolian Harp, 290.
 Ahren, J. H., Clay, 47; Pottery, 172.
 Ahrens, G., Table, 114.
 Aid Society, Reports, 285.
 Aiken, Lambert, & Co., Tooth Picks, 127;
 Gold Pens, 129.
 Ainsworth, T., Linens, 145.
 Aire & Calder Glass Bottle Company, 144.
 Aitchison, J., Jewelry, 147.
 Akerlinds Stock Co., Stoves, 212.
 Akira, Sasase, Motor, 236.
 Akron Iron Co., 19.
 Aladdin Oil Co., 108.
 Alagoas, Prov. of, Minerals, 97; Shoes, 244.
 Alard, A. F., Musical Staff, 289.
 Albany & Rensselaer Iron Co., 21.
 Albergotti Bros., Olive Oil, 217.
 Albert, C. F., Musical Instruments, 264.
 Albert, J., Violin, 264.
 Albert Manufacturing Co., Limestone, 46;
 Gypsum, 47.
 Albert Toilet Soap Co., 172.
 Albertson, J. M., Glass, 113.
 Albion Coal Co., 40.
 Albion Print Works, 121.
 Albrecht & Co., Pianos, 264.
 Alcock & Co., Billiard Table, 153.
 Alder Bros., Embroideries, 200.
 Alder & Meyer, Trimmings, 200.
 Alderson & Sons, Leather, 151.
 Alegre, J., Earthenware, 246.
 Alegre, J. F., Work Box, 248.
 Alessi, G., Essences, 217.
 Alessio Bros., Red Calico, 218.
 Alexandre, Fans, 185.
 Alexander, John S., Minerals, 13; Bayonet
 Spade, 20.
 Alexander, W. D., Map, 242.
 Alexandre & Son, Organs, 275.
 Alice Furnace, Iron Ores, 16; Iron, 21.
 Alli, M. C., Olive Oil, 217.
 Alamada, A. d', Hats, 244.
 Almeida, J. J., Glassware, 244.
 Almeida, Lucio, d', Books, 293.
 Almen, A., Gelatine, 213.
 Almgren, K. A., Silks, 212.
 Almonacid & Parchappe, Minerals, 99.
 Almonte Furniture Co., 173.
 Alnaop Agricultural Institute, Maps, 239.
 Alrich, A., Soap, 246.
 Altenberg & Graue, Pianino, 278.
 Alteneder, T., Instruments, 261.
 Altnorf, Bergmout, & Co., Toys, 128.
 Altman, M., Suspenders, 125.
 Alvergriat Bros., Instruments, 274.
 Alves, Soaps, 243; Candles, 243.
 Allen Bros., Castings, 177.
 Allen & Bro., Furniture, 113.
 Allen Cement Co., 18.
 Allen & Hauburys, Patè de Jujube, 141; Cod-
 liver Oil, 149.
 Allen, Hay, & Co., Soaps, 109.
 Allen, H. S., Books, 260.
 Allen, J., & Sons, Artificial Dentures, 134.
 Allen, J. M., & Co., Inks, 110; Boxes, 139.
 Allen & Johnson, Surgical Appliances, 134.
 Allen, J. T., & Co., Marble, 17.
 Allen, Lane, & Scott, Books, 261.
 Allen, Oliver, Petrified Wood, 14.
 Allegretti Refrigerator Co., 297.
 Allendale Co., Cottons, 120.
 Allentown Iron Co., 20.
 Allentown Rolling Mill Co., 15; Iron, 20.
 Allentown Slate Mantel Co., 17.

- Allgaier, Buggy, 299.
 Altemus & Co., Albums, 134.
 Amazonas, Province of, Hats, 244; Netting, 244.
 Amblet & Poncet, Oil, 199.
 Ambrosiussen, O. F., Scaffold, 210.
 Ambruster, John, Brickwork, 111.
 Amekio, Sekizawa, 236.
 Amelang, C. F., Books, 276.
 American Arms Co., 132.
 Am. Baptist Publication Society, Books, 261.
 American Bible Society, 260.
 American Bridge Co., 265.
 American Bronze Powder, 110.
 American Crockery Co., 112.
 American Hosiery Co., 125.
 American Howe Pin Co., 128.
 American Inlaid Wood Co., 118.
 American Kaolin Co., 18, 111.
 American Lead Pencil Co., 129.
 American Lever Wringer Co., 297.
 American Linen Co., 119.
 American Linoleum Manufacturing Co., 121.
 American Lock Manufacturing Co., 137.
 American Machine Co., Wringers, 297.
 American Missionary Association, Map, 266.
 American Moulded Collar Co., 125.
 American News Co., Books, 261.
 American Optical Co., Spectacles, 263.
 American Paper Box Co., 131.
 American Plate Glass Co., 112.
 American Paint Works, 121.
 American Reflector Co., 117.
 American Screw Co., 138.
 American Shade Roller Co., 116.
 American Sheet & Boiler Plate Co., 20, 118.
 American Shovel Co., 135.
 American Silk Label Mfg. Co., 124.
 American Stair Rod Co., 137.
 American Steamship Co., Models, 267.
 Am. Soc. of Civil Eng., Cent. Com. of, 265.
 American Sunday-school Union Books, 260.
 American Suspender Co., 125.
 American Tack Co., 138.
 American Tract Society, Books, 261.
 American Watch Co., 262.
 American Wire & Screw Nail Co., 138.
 Amersfoort, Mrs. H. M., Oratorio, 288.
 Amherst Stone Co., 17, 18.
 Ames Manufacturing Co., Swords, 132.
 Amidon's Son, T. A., Hats, 126.
 Amoskeag Mfg. Co., Cottons, 119.
 Amsberg, A., Knobs, 192.
 Amsler-Laffon, J., Hanimeters, 282.
 Amundson, Miss E., Embroideries, 45.
 Amwake, W. F. H., & Bro., Padlocks, 137.
 Ammirati, D., Chairs, 218.
 Ancaster Knitting Co., 128.
 Andalgá, Commission of, Salt, 245.
 Andalgala, Sub-Commission, Flowers, 249; Stone, 100.
 Andemars, L., Watches, 282.
 Anderson, A. T., Maps, 272.
 Anderson, D., & Sons, Felts, 146.
 Anderson, J., Wire Cloth, 212; Pins, 213.
 Anderson, T., Clay, 47; Bricks, 172.
 Anderson & Murrison, Wines, 168.
 Andés & Son, Varnish, 192.
 Andi, Bridge, Pails, 177.
 Andre, J., Books, 276.
 Andrews, C. B., Ferns, 243.
 Andrews, H., & Co., Woolens, 146.
 Andrews, Hitchcock, & Co., Iron, 22.
 Andres, Lambert, & Co., Glass, 201.
 Androscoggin Mills, Cottons, 118.
 Angas, J. H., Sheepskins, 162; Wool, 163.
 Angeli, C., Hats, 219.
 Angelini, R., Penmanship, 292.
 Angelucci, G., Shoes, 219.
 Angleur Steel Manufacturing Co., 74.
 Anglim, J., Books, 260.
 Angora, Blessbuck, 230.
 Angot & Dubreuil, Musical Instruments, 275.
 Ankarsums Works, Iron, 85.
 Annawau Manufactory, Cottons, 119.
 Anselmi & Marassi, Oils, 217.
 Ansley, F. W., Jewelry, 129.
 Ansonia Brass & Copper Co., 23, 137, 262.
 Anstey, G. A., Wool, 165.
 Anthoni, G., Axles, 186.
 Anthony, F., Liquors, 210.
 Anthracite Fuel Co., 16.
 Anton, E., Books, 276.
 Antoni-Bovy, Watches, 282.
 Antovine's, L., Son, Inks, 179.
 Aoki, G. T., Lanterns, 239.
 Aomi, G., Lacquer Ware, 240.
 Appenzell Board of Education, 280.
 Appenzell, Society for Promoting Public Welfare, 284.
 Appert, Lengele, & Co., Glass, 180.
 Applegate, R. O., Table, 297.
 Appleton, D., & Co., Bookbinding, 131; Books, 260.
 Appleton & Co., Cottons, 119.
 Arai, H., Lacquer, 238.
 Ararat, Council of, Views, 155.
 Archer & Pancoast, Chandeliers, 117.
 Archibald, T. D., Coal, 45.
 Arctander, L., Jackets, 215.
 Ardizzone, F., Sulphur, 94.
 Aren & Blumerheim, Embroideries, 190.
 Arens, A., Books, 286.
 Argentine Manufactory, Porcelain, 209.
 Arguello, D., Ores, 99.
 Arguello, E., Mats, 248.
 Arias, A., Lime, 100.
 Arles, D., Raw Silk, 182.
 Arlington Mills, Alpaca, 123.
 Armbruster, S., Carriage, 198.
 Armington, J. H., Engineering, 266.
 Armitage, T., Leather, 165.
 Armstrong, A., Wools, 157.
 Armstrong, F., Garters, 128.
 Armstrong, J. B., Seeds, 165; Carriage, 178.
 Armstrong, J. R., Stoves, 173.
 Arnold, E., Glass Letters, 187.
 Arnold, G., Wools, 157.
 Arntzenius, Jannink, & Co., Nets, 205.
 Arouca & Camp, Cotton Fabrics, 244.
 Arrosto, G., Citrates, 220.
 Art School, Drawings, 288.
 Artaria & Co., Maps, 279.
 Arteaga, A., Sarsaparilla, 249.
 Arthur & Dougherty, Stone, 36.
 Arthur, F., Cabinet Work, 144.
 Aseptui Amykos Stock Co., 211.
 Aschenbach & Miller, Perfumes, 111.
 Ash & Lacy, Galvanized Metals, 30.
 Asher & Adams, Specimens of Printing, 260.
 Ashevan & Walsh, Tools, 176.
 Ashland Furnace, Iron Ores, 15; Iron, 22.
 Ashley, C., Phaeton, 177; Sleigh, 178.
 Ashworth, E., & Sons, Cottons, 145.
 Astbury & Maddock, Earthenware, 112.
 Asterby & Strömbacca, Iron, 85.
 Asylum for Girls, Reports, 281.
 Assam, H. M., Pipes, 209.
 Assetodi Graziani Bros., Cotton Goods, 218; Blankets, 218.
 Assimonte, L., Drinking Cup, 246.
 Assoc. for Encourg't of Manuf's & Ind., 289.
 Associatio for Improvement of Workmen's Buildings, 289; Gravenhage, 289.
 Association of Women, Silk Pictures; Rugs, 237.
 Atha, Benjamin, & Co., Steel, 21.
 Atha & Hughes, Oil Cloths, 121.
 Atkinson, J., Perfumery, 142.
 Atkinson, H., Shirts, 125.
 Atkinson, W., Teazles, 157.
 Atterbury & Co., Glassware, 113; Lamps, 117.
 Atwater, J. H., Newspaper Files, 130.
 Atwood, H. W., Cologne, 111.
 Atwood & Richmond, Twist, 124.
 Aub, Hackenburg & Co., Silk, 123.
 Aubert Bros., Watch Springs, 282.
 Aubé, H., Napkin Ring, 184.

- Aubry, J., Faience, 180.
 Aubry, T., Stoves, 181.
 Auckland Patent Steam Rope Co., 164.
 Audibert, Monin, & Co., Silks, 183.
 Audibran, Elixir, 179.
 Audy, Mrs., Pearls, 184.
 Aue, T., & Kollman, V. D., Kid Gloves, 195.
 Auer, Henry, Silver Leaf, 19.
 Auer, J., Leather Gloves, 193.
 Augener, G., & Co., Classics, 268.
 Auld, P., Wines, 162.
 Auld, W., Cue, 242.
 Auliffe, I. H., Quartz, 161.
 Auret, W. H., Drugs, 167.
 Aurineta, C. M. A., Disinfectant, 292.
 Australia, Commercial Bank of, Bank Notes, 271.
 Australasia, National Bank of, Notes, 271.
 Austrian Glass Foundry Association, Glass Bottles, 193.
 Austro-Hungarian Civil Social Union, 280.
 Aurray, P. E., Odontine, 175; Wax, 171.
 Awellaneda, N., Embroidery, 248.
 Avesta Garpenbergs Stock Co., Ores, 84; Iron, 85.
 Awart & Sons, Leather, 193.
 Azi, H., Cottons, 189.
 Aydon Patent Smelting Co., Iron, 48.
 Ayer, J. C., & Co., Pectorals, Cathartics, 133.
 Ayers, Root, & Co., Spokes, 298.
 Azmoos Weaving Mills, Cotton Goods, 199.
 Baare, Fred., Silks, 124.
 Babey, C., Embroideries, 184.
 Baccilieri, L., Shoes, 219.
 Bacharach, M., Urinal, 298.
 Bachmann, F., Books, 281.
 Bachman, S., Shawls, 123.
 Bachnik, T., Pearl Buttons, 196.
 Bachi, J. G., Lithographic Institution, 276.
 Backer & Co., Polished Stones, 190.
 Backmann, J. F., Safe, 212.
 Bacon, B. H., Clock, 262.
 Bacon, Chas. N., Felts, 121.
 Bacon & Karr, Pianos, 264.
 Bacri, H. & S., Arms, Bournous, Hangings, Shawls, 227.
 Bacquet & Co., Laces, 184.
 Bacri, H. & Solomon, Furniture, 227.
 Badger, B. F., Razor Strops, 136.
 Badiole, H., Medicines, 186.
 Badollet, J. M., & Co., Watches, 282.
 Baeder, Adamson & Co., Whips, 127; Sand Paper, 137.
 Baedeker, C., Books, 276.
 Baedeker, J., Books, 276.
 Baelmi Bros., Hairsprings, 282.
 Baerlocher, Custer, Embroidery, 200.
 Baerresen, H. W., & Co., Carriages, 300.
 Baertsoen & Buysse, Cottons, 232; Linens, 203.
 Bagge, G. B., Map, 289; Maps, 290.
 Bagot, E. M., Meat Extract, 162.
 Baggott, H. W., Yellow Ware, 112.
 Bahia, Province of, Minerals, 97.
 Bahmann Bros., Thermometer, 262.
 Bailey & Co., Jewelry, 127.
 Bahse & Haendel, Desk, 188.
 Bailey & Co., Silver Ware, 116.
 Bailey, A., Tullies, 184.
 Bailey, E., Oil Paintings, 242.
 Bailey, G., Coal, 45.
 Bailey, John T., Salt, 108.
 Bailey, J. T., & Co., Rags, 118; Ropes, 139.
 Bailey, Leonard, & Co., Tools, 135.
 Bailey, W. & J. A., Earthenware, 143; Glassware, 144.
 Bailey Wringing Machine Co., 135.
 Bailey Wringing Machine, 297.
 Baillarge, C., Stereometrical Tableau, 271.
 Baird, H. C., & Co., Books, 260.
 Baker & Co., Wheels, 298.
 Baker, Arnold, & Co., Gas Fixturers, 117.
 Baker, C., Violins, 264.
 Baker, C., & Sons, Coffin Furniture, 149.
 Baker, Cavis, & Co., Books, 260.
 Baker, I., Wines, 162.
 Baker, J., Steps, 153.
 Baker, Joseph W., Metals, 23.
 Baker, H. J., & Bro., Chemicals, 107.
 Baker, John C., & Co., Cod Liver Oil, 108.
 Baker, Mine, Mica, 45.
 Baker, W., Awls, 149.
 Baker, W., Limestone, 46; Clay, 47; Bricks, 172.
 Bakewell, Pears, & Co., Glassware, 113.
 Baldwin, A. H., Magnetite, 45.
 Baldwin, E. P. & W., Metal Plates, 30.
 Baldwin, J., & Co., Hardware, 300.
 Balhaunak Mining Co., 161.
 Ballard Woolen Co., 154.
 Ballard Vale Mills, Flannels, 122.
 Ballantyne, Mrs., Limestone, 46.
 Ballou, G. C., & Son, Cottons, 119.
 Ballue, A., Illustrated Publications, 274.
 Bally & Schmitter, Webbing, 201.
 Balny, A., Work on Agriculture, 274.
 Balugera, A., Writing Case, 249.
 Balugera, E., Pillow, 249.
 Balvidares, V., Rope, 250.
 Bamble Nickel Mines, 88.
 Bambula, J., Bronzes, 197.
 Bancroft, J. A. & Co., Furniture, 257.
 Bancroft, J. S., & Co., Hats, 126.
 Bank, F., Ventilator, 272.
 Banks, E. H., Cereals, 164.
 Bapterosses, F., Buttons, 184, 185; School Materials, 273.
 Baran & Coles, Jars, 181.
 Baras, N., Cloth, 203.
 Barbaceua, Viscount de, Coal, 97.
 Barbarulo, A., Cloths, 218.
 Barbarule Bros., Cloths, 218.
 Barber Match Co., 111.
 Barber & Co., Tweeds, 174; Hosiery, 174.
 Barber, W., & Bros., Paper, 175.
 Barbizet, Son, Faience, 180.
 Barbridge, S. & H., Trunks, 175; Harness, 178.
 Barbour Flax Spinning Co., 121.
 Barclay & Morrison, Dolomite, 46.
 Bardon & Ritton, Silks, 183.
 Bardon, J. P., Cigarette Paper, 185.
 Bardon & Sons, Optic Instruments, 275.
 Bareiss, F., Furs, 129.
 Bargioni, F., Ropes, 220.
 Barker, Moore, & Mein, White Lead, 110.
 Barker Mills, Sheeting, 118.
 Barker, G. R., Heating Apparatus, 296.
 Barkly, Sir H., Bitter Barks, 167.
 Barlen & Jones, Quilts, 145.
 Barnard, B., Furniture, 144.
 Barnard, Bishop, & Barnard, Iron Work, 144.
 Barnard, G. L., Oils, 161; Wines, 162.
 Barnard, S. B., Photographs, 163.
 Barnard Manufacturing Co., Cottons, 119.
 Barnes, A. S., & Co., Books, 257.
 Barnhurst & Robinson, Umbrella Strh's., 128.
 Barney, E. H., Skates, 106.
 Baroncelli, B., Bicarb. of Potassium, 216.
 Barsalon Soap Works, 171.
 Barstow Stove Co., Stoves, 295.
 Bartels & Koyeman, Chemicals, 187.
 Barth, D., Pipes, 201.
 Barth & Wagner, Toys, 191.
 Bartholomew, J., Maps, 263.
 Bartolini dott Cesare, Flour, 94.
 Barton, Charles, Silver Ores, 13.
 Barton, W. E., Bells, 139.
 Bartlett, J. W., Lamps, 117.
 Bartlett, Butman, & Packer, Trusses, 134.
 Bartlett, J. R., Catalogue, 260.
 Bartlett, J., & Sons, Furnaces, 295.
 Barwon Woolen Mill Co., 154.
 Barry & Lane, Range, 295.
 Barra, L., Book, 292.
 Barrett, J. W., Embroideries, 127.
 Barrett, Arnold, & Kimball, Paper, 132.
 Barrett & Co., Waters, 150.
 Barros, A., Books, 294.
 Barros, J., Bricks, 100.

- Barros, R. Paez de, Newspapers, 293.
 Barrows, Savery, & Co., Hollowware, 296.
 Barry, Arnold, Co., Wheat, 168; Flour, 169; Wool, 169.
 Barry & Herdon, Diamonds, 167; Kafir-Assegais, 167; Map, 167; Wine, 168; Stuffed Birds, 168; Aloes, 168; Pictures, 168.
 Barry & Nepheus, Brandy, 168; Beeswax, 168; Aloes, 168; Wool, 169.
 Bas-Cañan, F., Minerals, 99.
 Basle City Board of Education, 280.
 Basle, Soc. for Promoting Pub. Welfare, 284.
 Basle-Stadt, Building Depart. of, Plans, 283.
 Basle, Zoological Gardens, Direction of, 284.
 Basquin, Hector, & Schweizer, Embroid., 200.
 Bass, Abrate, & Co., Blankets, 218.
 Bassett, G. A., Laundry Gloss, 109.
 Bassett, N., Sifter, 297.
 Bass River Steam Saw Mill, 155.
 Bassolini, V., Colors, 217.
 Batchelder & Co., Photographs, 155.
 Bates Manufacturing Co., Cottons, 121; Woolens, 122.
 Bates, Walker, & Co., Dinner Ware, 143.
 Batka, F., Glassware for Chem. Purposes, 193.
 Batley, J., Cradle, 117.
 Battenberg & Co., Lamps, 205.
 Baudenbacher, C., 191.
 Baudet, Piano, 275.
 Baudissin, Countess B., Artificial Fl's, 196.
 Baudon, Antimonial Wine, 179.
 Baudoux & Co., Glass, 201.
 Baudoux, E. & J., Glass, 202.
 Baudry, T., Works on Engineering, 274.
 Bauer, A., jr., Musical Instruments, 278.
 Bauer, A., Velvets, 194.
 Bauer Bros., Woolens, 194; Clothing, 194.
 Bauer & Pokorny, Pipes, 197.
 Bauer's Type Foundry, 276.
 Baumann, senior, & Co., Silks, 199.
 Baumann & Streuli, Silks, 199.
 Baumann, A., Father, & Son, Carvings, 285.
 Baumer, W., 279.
 Baumgardner, Woodward, & Co., Cordage, 139.
 Baunerman, R., Clay, 47.
 Bausch & Lomb, Optical Instruments, 263.
 Baxter, B., Limestone, 46.
 Baxter, R., Boots, 147.
 Bayer & Co., Chemicals, 187.
 Bayer, J., Mathematical Instruments, 278.
 Bayer, R., 279.
 Bayet Bros., Weapons, 204.
 Bay of Fundy Red Granite Co., 46.
 Baynes Sound Mining Co., 45.
 Bay State Iron Co., 21.
 Bayview Quarry Co., 46.
 Bazau, A., Bricks, 100.
 Beale, Horace A., Iron, 20.
 Bealey, S., Wool, 165.
 Bean, Lewis U., Drugs, 108.
 Bean & Jardine, Vases, 232.
 Bear & Ford, Wine, 157.
 Beatty, L. J., Penmanship, 271.
 Beaudet, H. J., Cradle, 117.
 Beaumarchez, L., Maps, 275.
 Beaver Falls Cutlery Co., 136.
 Beccari, G. A., Newspaper, 292.
 Bechmann, A. F., Bronzes, 197.
 Beck, C., Cards & Paper, 131.
 Beck, C. H., Books, 276.
 Beck, E., Linens, 189.
 Beck, F., & Co., Wall Papers, 132.
 Beck, R. & I., Microscopes, 269.
 Beckensteimer, Works on Electricity, 274.
 Becker, C., 191.
 Becker, F., 191.
 Becker, G., Regulator, 278.
 Becker, I., Quartz, 161.
 Becker & Hoffbauer, Carpets, 190.
 Beckh, G. A., 188.
 Beckhaus, J., Carriages, 299.
 Beckhoffer, E., Calligraphy, 268.
 Beckley, F. W., Set of Kapa, 242.
 Bécoulet & Co., Papers, 185.
 Bedoya, S., Silver, 101.
 Bedichimer, I., Emblems, 127.
 Bedini, G., & Sons, Harp Strings, 202.
 Begerem, R., Lace, 203.
 Begner, F., Silk, 247.
 Behlen, C., Barouche, 300.
 Behmers, A., 223.
 Behring & Diehl, Pianos, 265.
 Beihl, F., Bronzes, 197.
 Beim, C. A., Liquors, 210.
 Beins, H., Apparatus, 288.
 Bel Air Manufacturing Co., Woolens, 121.
 Belding Bros. & Co., Silk, 123.
 Belfast Mills, Gingham, 121; Woolens, 122.
 Belfont Furnace, Iron Ores, 16.
 Belfont Iron Works, 21.
 Belgian Gov. Educat'nal Dep., Furniture, 286.
 Bell, A., Braids, 200.
 Bell, C. R., Horseshoes, 178.
 Bell, D., Clay Tile, 47; Drain Tiles, 172.
 Bell, H., Tallow, 151; Bonedust, 152.
 Bell, R., Manufactures, 272.
 Bell, W., & Co., Organs, 272.
 Bell, R. W., & Co., Soaps, 111.
 Bell, W. M., Drain Pipe, 111.
 Bell, W. & D., Pipes, 172.
 Bella Vista, Sub-Com. of, Stone, 100; Yarns, 247.
 Bellefonte Furnace, Iron Ores, 14; Iron, 22.
 Bellest, E., & Co., Cloth, 182.
 Belleville Col., Reports, 274.
 Bellezza, N. A., Jewelry, 219.
 Belliveau Albertite & Oil Co., 45, 172.
 Belson, R. W., Furnace, 296.
 Belvidere Woolen Manufacturing Co., 122.
 Bemis & Call Hardware & Tool Co., 135.
 Ben, M., Maps, 292.
 Benas, J. P., Instruments, 185, 186.
 Benker & Son, Gloves, 194.
 Bencker, J. W., Leather Gloves, 295.
 Bender & Phillips, Sheet Wax, 130.
 Bendigo Pottery Co., 153.
 Benedict & Burnham Manufacturing Co., 23.
 Beneficial Association, Models, 289.
 Benelische, F., Blank Books, 249.
 Benevolent Society, Hemp, 246.
 Benzet & Co., Springs, 298.
 Bengtson, B., Chemical, 211.
 Benham Organ Co., 264.
 Benjamin, E. B., Apparatus, 261.
 Benjamin, H., & Co., Marble, 46.
 Benk, G., Clocks, 278.
 Bennett, E., Shirts, 126.
 Bennett, J., Newspaper Files, 173.
 Bennett, T. K., Meats, 156.
 Bennett & Smith, Felts, 122.
 Bennett & Bivort, Glass, 202.
 Bennett, W., Coal, 45.
 Bentl, A., Buttons, 197.
 Bentley, J. O., Embroideries, 126; Base-board, 295.
 Benton, Caroline C., Iron Ores, 13.
 Benucci & Latti, P., Majolica Vases; & Dishes, 218.
 Berea Stone Co., 18.
 Berg, A., Ores, 84.
 Berg, C. L., Mineral Waters, 84.
 Berg, F. J., Wigs, 213.
 Berg, G., Ores, 84.
 Berg, G. W., Gunpowder, 211.
 Berg, H., Glassware, 215.
 Berg, J. T., Yarns, 212.
 Berg, S., Albumen for Gloves, 195.
 Bergasse, C., Felt, 203.
 Bergé & Berg, Artificial Flowers, 127.
 Bergen, C. von, & Co., Carvings, 285.
 Bergen Gas Works, Ammonia, 214.
 Bergen School Board, School Materials, 271.
 Berger, E., Napkins, 194.
 Berggren, A. N., Penholders, 213; Penmanship Method, 289.
 Berghammer, F., Artificial Teeth, 198.
 Bergman, F., Imitation Gems, 195; Bronze Articles, 196.

- Bergman Co., Wool, 189.
 Bergner, T., Drawing Boards, 129.
 Bergsbro Stock Co., Wool Fabrics, 212.
 Bergslag Iron Works, 85.
 Bergström, P. N., Furs, 213.
 Berkeley & Co., Cottons, 118.
 Berkey & Gay Furniture Co., 114.
 Berkshire Woolen Co., 122.
 Berlie, E., Springs, 282.
 Berlin, J. W., Glass, 188.
 Berlin Umbrella Factory, 191.
 Berlin, Mrs., Classical Books, 274.
 Berlinguet, F. H., Models, 272.
 Bernabei, A., Syringes, 220.
 Bernard, J., & Co., Papers, 185.
 Bernardo, M., Quartz, 161.
 Berne, Canton of, Board of Education, 280.
 Berne, Dep't of Public Works, Maps, 283.
 Berne, Canton, Dep't of Public Works, 284.
 Berney, A., Stove Ware, 296.
 Bernhardt, J., 188.
 Berr, E., Kid Gloves, 184.
 Berthoud & Co., Blacking, 179.
 Bertini, E., Crockery, 218.
 Bertram & Co., Gold, 101.
 Bertrand, B., Tapestries, 182.
 Berry, J., Pianos, 265.
 Berry, J. S., Oil, 152; Bonedust, 152.
 Besancet-Blanc, E., Jewels, 282.
 Beslier, A., Pharmaceutics, 179.
 Bessbrook Granite Works, 29.
 Besson, F., & Co., Instruments, 269.
 Best, J., Wine, 157.
 Bethell, J. P., Surgical Apparatus, 134.
 Bethlehem Iron Co., 20.
 Bettonville, C., Cloth, 203.
 Bettman & Kupfer, 191.
 Betou, J. P., Rifle, 206.
 Betou, P. J., Instrument, 288.
 Beunon, Piano, 275.
 Beust, F., Books, 281.
 Beutel, F., Wicker work, 194; Shoes, 195.
 Bevan, T., Phormium, 165.
 Bevan, T., jr., Rope, 164.
 Bevan & Sons, Cordage, 164.
 Bevin Bros., Kettles, 137.
 Beyer, E., Inks, 188.
 Beysons & Beckers, Religious Articles, 181.
 Bianchi & Molinari, Wooden Floor, 218.
 Bickel, A., & Son, Crutches, 128.
 Bickford, A. M., Bitters, 163.
 Bickford, D., Knitted Goods, 126.
 Bickford, Smith, & Co., Fuses, 142.
 Bicknell, A. J., & Co., Books, 260.
 Bicque & Dupressoir, Feathers, 184.
 Biddle Bros., Preserves, 152.
 Bie, C., Arithmometer, 209.
 Bierremback, Hats, 244.
 Bierremback & Bro., Iron Chair, 244.
 Bigelow Carpet Co., 123.
 Bihn & Co., Lampblack, 109.
 Biggs, John, Iron, 29.
 Bilger, C., Harmonicas, 278.
 Billar, S., Petroleum, 246.
 Billberg, C. H., Pianos, 290.
 Billeter, C. G., Thread, 199.
 Billings, Clapp, & Co., Chemicals, 108.
 Billings & Spencer Co., Firearms, 132.
 Billstrom, Mrs. A., Flowers, 213.
 Binder, W., 191.
 Binder Bros., Carriages, 187.
 Bindschedler & Busch, Dye Stuffs, 199.
 Biolley, F., & Son, Cloth, 203.
 Biolley, Bros., & Co., Cloth, 203.
 Bion & Tschumper, Embroideries, 200.
 Birch, F., Millstones, 88.
 Birchall, J. D., & Co., Woolens, 146.
 Bird, G., Cheese, 156.
 Birdsall & Son, Binding, 148.
 Birindelli, C., Waters, 94.
 Birkey, J. Q., & Co., Heaters, 296.
 Birmingham & Lacy, Bricks, 153.
 Bishop, A., Magnetite, 45.
 Bishop, H., Sandstones, 46, 47.
 Bishop, J., Crucibles, 133.
 Bissinger, C., Polished Stones, 190.
 Bitterlin, P., jr., Glass Ware, 181.
 Bitterlin, Son, Glass Ware, 181.
 Bitterlin, Schmidt, Jewels, 282.
 Bitzer, Bros., 191.
 Bivort, R., Copper Work, 74.
 Bjork, J. O., Hardware, 212.
 Bjorneborgs Factories, Iron, 85.
 Bjorneborgs Stock Co., Ores, 84.
 Blabon, G. W., & Co., Oil Cloths, 121.
 Black, W. B., Woods, 164.
 Black Band Iron Co., 13.
 Black River Stone Co., 18.
 Blacklock, W., & Co., Shirts, 174.
 Blackstone Manufacturing Co., Cottons, 118.
 Blackwood, J., & Co., Inks, 142; Sealing Wax, 148.
 Blackwood, R., Amethyst, 45.
 Blain, C. R., Maize, 151.
 Blair's, H. C., Sons, Toilet Articles, 111; Wheat Food, 133.
 Blake Bros. Hardware Co., 138, 149.
 Blake & Johnson, Hair Pins, 129.
 Blanchard, N. S., Hematite, 45.
 Blanchard & Lippitt, Iron Ore, 13.
 Blanche Furnace, Etna Iron Co., 14; Iron, 21.
 Blanchet, A. P., Channel, 275.
 Blanchet Bros. & Kleber, Paper, 185.
 Blanck, W., & Son, Artificial Limbs, 133.
 Blandford, H., Mirror, 173.
 Blauvelt, Jas. C., Coal, 16.
 Blaylock & Co., Furs, 129.
 Blazincic & Sons, Haberdashery, 195.
 Bleasdale, J. L., Precious Stones, 35.
 Bless & Drake, Polishing Irons, 297.
 Blessing, C. A., Bath Tub, 298.
 Bleyberges Montzen Joint Stock Co., Ores, 74.
 Blin & Block, Cloth, 182.
 Blind Institute, Relics, 288.
 Bliss, J., & Co., Marine Instruments, 262.
 Bliss, W., & Son, Woolens, 146.
 Blitz & Co., Baskets, 205.
 Bloch & Sons, Pouches, 197; Saddle Cloth, 198.
 Bloedner's, J. C., Son, Chemicals, 187.
 Blombacka Stock Co., Matches, 211.
 Bloodgood, Miss A. E. D., Wax Flowers, 127.
 Bloom Furnace, Iron Ores, 14; Iron, 21.
 Bloesch, Dr., Reports, 285.
 Blot, E., Pipes, 184.
 Blot, P., China, 180; China Ware, 181.
 Blumenan, Colony of, Cotton Fabrics, 244.
 Blumer & Wild, Hosiery, 200.
 Blunck, C., Metal Ware, 215.
 Blüthner, J., Piano, 278.
 Board of Trade Drawing School, 200.
 Bob, Lorenz, Clocks, 278.
 Bock, C. A., Paper, 213; Pulps, 213.
 Bock, E., Pearl Buttons, 190.
 Bock, H., Photographs, 155.
 Boddy, E., Flour, 156.
 Bodè, P., Matches, 211.
 Bodington, R., Sheep Support, 158.
 Bodwell Granite Co., 17.
 Boeck, C., Brushes, 177.
 Boeck, W., & Danielsen, Treatise, 291.
 Boeddinghaus, W., & Co., Cloths, 187.
 Boeddinghaus, F., & Son, Cloths, 189.
 Boehm, P., Polished Stones, 190.
 Bohannan, W., Padlocks, 137.
 Böhme, F., & Co., Picture Frames, 199.
 Böker, H., & Co., Cutlery, 209.
 Boer, F. N., Model, 289.
 Boericke & Tafel, Homeopathics, 133.
 Bötterling & Shultze, Cottons, 189.
 Bofors Stock Co., Ores, 84.
 Bogart, J., Engineering, 266.
 Bogle, A., & Co., Machine, 153.
 Bohland & Fuchs, Instruments, 279.
 Bohm, L., Bronzes, 197.
 Bohm, A., Bronzes, 197.

- Boivin & Co., Tools, 176.
 Boland, F., Frames & Glasses, 116.
 Bolari & Yellow Earth Co., 94.
 Boien & Byrne, Siphons & Min. Waters, 19.
 Bolinders, J., & C. G., Stoves, 212.
 Bolzani, Jean, Son, Chains, 184.
 Bolzani & Fussi, Gold Chains, 195.
 Bombches, F., 279.
 Bomsdorff, Oscar v., Books, 276.
 Bon, R., Laces, 219.
 Bonacina, C., Varnishes, 217.
 Bond, J., Bitters, 176.
 Bondier, Ulbrich, & Co., Pipes, 184; Cigarette Paper, 185.
 Bonehill Bros., Iron, 74.
 Bonfantini, G. A., Album, 285.
 Bonhomme, Uncle & Nephew, Doors, 181.
 Bonei, C. O., Olive Oil, 216.
 Bonini, E. P., Zinc Goods, 220.
 Boniotti, P., Document, 287.
 Bonnet & Co., Raw Silk, 182.
 Bonnet, C., & Co., Types, 285.
 Bon Pasteur, Montreal, 272.
 Bontems, B., Mechanical Birds, 184, 275.
 Bonwill, W. G. A., Dental Appliances, 134.
 Bonvy, J. J. B., Glassware, 205.
 Book Store of the Orphan Asylum, 276.
 Boolak Mechanics' Institute, 225.
 Boorum & Pease, Blank Books, 131.
 Boosey & Co., Instruments, 269.
 Booss, F., & Bro., Furs, 129.
 Boot & Shoe Co., 175.
 Boot & Shoe Factory, 175.
 Booth, G., Wrench, 176.
 Booth, J., & Son, Tools, 135.
 Both, W., Sign Painting, 173.
 Booth & Son, Copper Work, 177.
 Boott Cotton Mills, 119.
 Boquet, J., & Co., Velvet, 182.
 Boras, Works of Pupils, 289.
 Borddal, J., Tables, 244.
 Borden City Mills, Cottons, 120.
 Borel, L., & Co., Machines, 286.
 Borel & Courvoisier, Watches, 282.
 Borel, Petitpierre, Tools, 286.
 Borelli, L., Cream of Tartar, 216.
 Bornet, P., Signs, 187.
 Borg, O. E., Apparatus, 289.
 Borm, L., Dress Suit, 125.
 Borsig, A., Products of Mines, 60.
 Borst & Roggenkamp, Stones, 79.
 Borthen, J., Oil, 214.
 Borthwick, A., Varnishes, 153.
 Bortolotti, P., Felsina Water, 217.
 Bosisto, J., Chemicals, 153.
 Bosler, Marcus, Stone, 18.
 Bossi, E., Gloves, 219.
 Bossi, G., Caps, 195.
 Boston Comfort Corset Co., 125.
 Boston Hydraulic Motor Co., 267.
 Boston Manufacturing Co., Cottons, 110.
 Boston Musical Instrument Manufactory, 265.
 Boston & Sandwich Glass Co., 112.
 Botanic Gardens, Paper, 154.
 Bothwell, W., Harness, 154.
 Botelberge, G., & Co., Ultramarine, 201.
 Botten, W., Wine, 157.
 Bottenheim, D. & S., Yarns, 205.
 Botti, A. C., Olive Oil, 217.
 Botto, P., Gun, 220.
 Boucher, Gravet, Clocks, 274.
 Bouchinet, Dress Goods, 183.
 Boude & Son, Sulphur, 179.
 Boudon, Louis, Raw Silk, 182.
 Boudvillain, J., Trophy, 187.
 Bougart, A., Crystals, 202.
 Bougard, Le Brun, & Co., Glass, 202.
 Boughton, J. W., Wood Carpet, 117.
 Bouhon, F., Shoes, 203.
 Boulanger, Mrs., Books, 274.
 Boulenger, Senior, Mosaics, 180.
 Boulonikon Floor Cloth Mfg. Co., 146.
 Bourcier, C., Jewelry, 184.
 Bourcneau, L., Marbles, 202.
 Bourgeois, M., jr., Decorative Paintings, 185.
 Bourgeois, sr., Paints, 179; Colors, 184.
 Bourgeois, N., Hair Picture, 249.
 Bourgeois & Co., Oils, 179.
 Bourquin, C. F., Hosiery, 200.
 Boussee, Fauiliellereux, & Black, Glass Works, 202.
 Boutenjeun, Laces, 184.
 Bouvier, A., Skeleton, 274.
 Bowditch, E. W., Plans, 266.
 Bower, Henry, Acids, 108.
 Bowers, J., & Co., Corsets, 125.
 Bowman, C., Ink, 142.
 Bowman, C. A., & Bro., Brushes, 139.
 Bowman, J. S., Crayons, 153, 154.
 Boeoman, O. O., & Co., Terra Cotta, 111.
 Boyce, J. R., Toys, 177.
 Boyd, D., Flue Radiator, 296.
 Boyd, E., Miss, Spatter Work, 242.
 Boyé & Lewis, Oils, 109.
 Boyle, J., Mail Bags, 266.
 Boys' Boarding School, Coal, 242; Woods, 243.
 Bozzalla, A., & Bro., Woolen Goods, 218.
 Bozzalla, Gio, & Son, Woolen Goods, 218.
 Bracquenie Bros., Tapestries, 182.
 Bradford, H., Quartz, 18.
 Bradford, H. W., Litholycite, 133.
 Bradley & Hubbard, Gas Fixtures, 117; Bronzes, 128.
 Bradley & Gilbert, Blank Books, 131.
 Brady, Edward, Skates; Armor Plates, 20.
 Braeunlich & Co., Toothpicks, 128.
 Braeunlich, W., & Co., Gold Pens, 130.
 Brainerd, Armstrong, & Co., Sewing Silk, 241.
 Braithwaite, A., Wool, 165.
 Brand, E., Tools, 176.
 Brandt, C., Furs, 215.
 Branford Lock Works, 138.
 Brandl, P., Pearl Buttons, 196.
 Brandstetter, F., Books, 276.
 Brantzeg, P., Pianos, 291.
 Braquinie Bros., Tapestries, 203.
 Brasche, C., Wine, 157.
 Brasher, W. M., & Co., Oil Cloths, 121.
 Brasier & Chadhand, Hats, 175.
 Brass, J., & Son, Harness, 170; Honey, 170.
 Brasseur, Pectoral Syrup, 179.
 Bratti, Seratilli, & Co., Music, 292.
 Brannck, E., Leather Gloves, 195.
 Brauncis, I., Pearl Buttons, 196.
 Brautigan, N. A., Mattress, 114.
 Bravais, Rovul, & Co., Pharmaceuticals, 179.
 Brazil Industrial Co., Cotton Fabrics, 244.
 Brazil, General Commission of, Piano, 293.
 Brearley Bros., Leather, 156.
 Brecht, C. J. P., Wines, 152.
 Bruder & Nelke, Scissors, 136.
 Breguet & Co., Chronometers, 274.
 Brehmer, E. F. A., Registering Apparatus, 290.
 Breidenbach & Co., Books, 276.
 Breitkopt & Hartel, Books, 276.
 Bremond, B. A., Musical Box, 283.
 Breman, M., Sashes, 174.
 Brese & Starke, Quartz, 161.
 Bresh, Jac., Buttons, 197.
 Bresse, G., Boots, 175.
 Bressen-Agnés & Co., Silks, 183.
 Breting Bros., Watches, 282.
 Brewster Bros., Corsets, 125.
 Brewster & Co., Carriages, 299.
 Brewster, J. B., & Co., Vehicles, 299.
 Brianchon, J., senior, Porcelain, 180.
 Bridge Mill Cotton Manufacturing Co., 119.
 Briere, J., Nipples, 186; Nursing Nipples, 276.
 Brigg, J. F., & Co., Woolens, 146.
 Briggs, R., Engineering, 266.
 Briggs, Joshua, Piano Stools, 114.
 Bright, Bros., & Co., Antimony, 36.
 Bright, H. C. R., Ores, 167.
 Brigola, G., Books, 292.
 Brill, J. G., & Co., Car, 302.
 Brinckeroff, Turner, & Co., Cottons, 119.
 Brisley, W., Clip Hook, 177.

- Brinsmead, J., & Son, Pianos, 269.
 Brinton, Joseph H., Stone, 17.
 British & Foreign Blind Assoc., Maps, 263.
 Brittain, R. J., Instruments, 263.
 Broad Brook Co., Cassimeres, 121.
 Brocard, P. J., Mirrors, 180.
 Brocard, P. T., Glass, 181.
 Broch, J., Filter, 297.
 Brochocki, C. D., & Co., Javelle Water, 180.
 Brockhaus, F. A., Books, 276.
 Brockley & Co., Pianos, 272.
 Brodin, jr., Aërostatic articles, 184.
 Brodure, M., Woodwork, 202.
 Brohme & Co., Chemicals, 187.
 Bromley, J., & Sons, Carpets, 123.
 Brondum, A., Liquors, 210.
 Bronfort & Bros., Boxes, 202.
 Bronze Manufacturing Co., Chandeliers, 189.
 Bronze Composition, Bronzes, 186.
 Brook, J., & Bros., Spool cotton, 145.
 Brooke, E., & Sons, Bricks, 142.
 Brookes & Crookes, Cutlery, 149.
 Brooks & Patton, Hollow Ware, 298.
 Brooks, Mrs. G., Bark fans, 170.
 Brookside Hosiery Mills, 126.
 Brousson, J., & Son, Nails, 192.
 Brosset-Heckel & Co., Satins, 183.
 Brower Bros., Stationery wares, 129.
 Browett, F., & Co., Frillings, 147.
 Brown, A., Gypsum, 47.
 Brown & Co., Ores, 13; Iron, 20.
 Brown & Brothers, Copper and brass, 23;
 Plated goods, 116.
 Brown & Bros., Blank books, 176.
 Brown, J., Pyroliesite, 45; Axes, 176.
 Brown, J., & Co., Ropes, 177.
 Brown, E., Harps, 272.
 Brown, G. W., Table, 242.
 Brown, R. H., Coal, 45.
 Brown, Frederick, Jamaica ginger, 108.
 Brown, R. B., & Co., Castor oil, 108.
 Brown, Warren, Powders and soaps, 109.
 Brown & Bliss, Furniture, 114.
 Brown, D. S., & Co., Prints, 121.
 Brown, E., Straw hats, 126.
 Brown, E. P., Gold fillings, 134.
 Brown & Owen, Iron work, 139.
 Brown-Westhead, Moore, & Co., China, 143.
 Brown, J. B., & Co., Wire netting, 145.
 Brown, J. S., & Sons, Linens, 145.
 Brown, H. J., Wires, 157.
 Brown, J. T., Frames, 173.
 Brown & Clagget, Dresses, 175.
 Brown, T. N., & Co., Wheels, 298.
 Brown, John A., & Co., Armor plates, 30.
 Brownfield, W., & Son, Pottery, 143.
 Brownhill's Pottery Co., 143.
 Browning & Bros., Acids, 108.
 Browning, G., Minerals, 209.
 Browne, W. J., Wool, 163.
 Browne & Buckwell, Harp, 265.
 Browne, H. J., Pianos, 269.
 Browne, J., Chart stand, 271.
 Brückner, Lampe, & Co., 188.
 Bruce Salt Co., 171.
 Bruckman, F., Books, 276.
 Bruder, O., Laces, 197.
 Brugsch, E., 223.
 Brugsch Bey, 223; Porcelain, 224.
 Bruhn, A., Wines, 157.
 Bruna, E., Ashes, 245.
 Brunell, J. E., Penholders, 213.
 Brundle & Mohr, Battery, 272.
 Brunet, J., Monument, 46.
 Brunet, P., Bronzes, 181.
 Brunfaut, J. de, Glass jewelry, 195; Toilet
 articles, 196.
 Brunius, C. G., Archæology, 289.
 Brunt, Bloer, Martin, & Co., Crockery, 112.
 Brunnhauer, H., 188.
 Brunner, A., Counterpanes, 199.
 Brunner, A. & F., Plans, 284.
 Brummer, Mond, & Co., Alkali, 141.
 Brunning, O., Pianos, 275.
 Brunnschweiler, Caseum, 199.
 Brunnschweiler & Son, Inks, 199.
 Brusa, G. B., Album, 219.
 Brussels Gymnastic Assoc., Statutes, 287.
 Brusewitz, F., Glassware, 211; Table glass,
 212.
 Bruton, C. I., Photographs, 168.
 Bruyneel, senior, Lace, 204.
 Bruzzesi, G., Shoes, 219.
 Bryan, C., Jet, 147.
 Bryan, I., Lightning rods, 263.
 Bryant & May, Matches, 142.
 Buasso, L., Shoes, 248.
 Bubb & Co., Woolens, 146.
 Buchanan, J., Fishhooks, 149.
 Buchanan Mineral Co., 46; Paints, 172.
 Bucher, I. J., Instruments, 279.
 Bucher, H., Maps, 291.
 Buck Bros., Chisels, 135.
 Buck, T. S., & Co., Rubber type forms, 129.
 Buckeye Furnace, Iron ores, 14; Iron, 21.
 Buckhora Furnace, Iron ores, 14; Iron, 21.
 Buckingham Mining Co., 48.
 Buckley, E., Wheat, 156.
 Buckley, J., & Co., Shawls, 146.
 Buckley, J. E. & G. F., Shawls, 146.
 Buckman, J., Hinge, 138.
 Budan, J., Gloves, 194.
 Buenavista Furnace, Iron ores, 14; Iron, 22.
 Buenos Ayres, Com. of, Indian work, 247;
 Medicinal herbs, 250; Silver spurs, 250;
 History, 294; Publications, 294; Figures,
 294.
 Buenos Ayres, Topographic Department of,
 Maps, 249.
 Buenos Ayres, National Library of, 294.
 Buff & Berger, Levels, 261.
 Buffalo Furnace, Iron ores, 14; Iron, 22.
 Buffeti & Maya, Hats, 248.
 Bühler, E., Chemicals, 199.
 Bulleck, Miss M., Fancy work, 175.
 Bullivaut, T., Sash window, 145.
 Bullock & Crenshaw, Pills, 107.
 Bullock, G. & J. M., Warps, 120; Woolens,
 122.
 Bullot, C., Millinery goods, 183; Stockings,
 183; Millinery, 184.
 Bulmer & Douglas, Bricks, 172.
 Bulmer & Sheppard, Bricks, 172.
 Bundrer Reformatory, Reports, 285.
 Burbach Furnace, 60.
 Burchardt, C. A., Flowers, 191.
 Burdett Organ Co., 264.
 Burleigh, Desbarats, & Co., Printing, 176.
 Burleigh, J. B., Relics, 261.
 Burley, S. W., Books, 260.
 Burlington Glass Co., 173.
 Burlington Woolen Co., 121.
 Burlock, S. D., & Co., Book bindings, 131;
 Albums, 260.
 Burmeister, C. C., 208.
 Burne, Chas. C., Paint, 172.
 Burgess, A., Rifles, 132.
 Burgier Bros., Phosphate of bronze, 70.
 Burgin, G., Nails, 201.
 Burgess, T., Botanical specimens, 271.
 Burnham, C., & Co., Stoves, 295.
 Burnett, J., & Co., Colognes, 111.
 Burnett, W. H. & R., Furs, 129.
 Burpee, M., Drawing, 272.
 Burt, E., Insect powder, 108.
 Burtis & Graff, Furnaces, 295.
 Burton Bros., Views, 164.
 Burton, B., Rifles, 133.
 Burringer Bros., Coat of arms, 140.
 Burrington, H. H., Gynæcological apparatus,
 134.
 Burrow, Chatterfield, & Co., Tin work, 173.
 Burwell, W., & Bro., Carriage mountings, 298.
 Buscarlet, widow, & Malo, Gloves, 184.
 Busch Bros., Cottons, 189.
 Buschor, C., Furniture, 114.
 Bush, G. H., & Co., Atomizers, 112.
 Busse, G., & Co., Filters, 145.

- Bussey, G. G., Leather work, 148.
 Bustamente, A., Blanket, 247.
 Bustin, R., Pasting machine, 176.
 Bustini, J., Violin, 294.
 Bustos, M., Pictures, 249.
 Butler, J. H., & Co., Books, 260.
 Butterick, E., & Co., Patterns, 124.
 Buttkerit, C. G., Piano, 264.
 Buttner, E., & Co., Paper, 191.
 Buxton, G., Limestone, 46.
 Buzzie, G. F., Marble furniture, 218.
 Bye, E. M., Stonework, 17.
 Byrne, W. F., Refrigerator, 297.
 Byrns & Bryan, Ale pump, 267.
 Byers, J., Albertite, 45.
 Byers & McIlhainy, Stone, 18.
 C. Cam. Theophilus, Books, 292.
 Camballero, E., Graphite, 101.
 Cabelli, C., Embroidery, 248.
 Cable, Bayard, & Co., Rack, 174; Razor strop, 176; Halter clasps, 178.
 Cabot Manufacturing Company, Cottons, 119.
 Cabral, J. T., Embroidery, 248.
 Cabral y Melo, J. M., Rock, 99.
 Cadwallader, Fitz-Gibbon, & Co., Vehicles, 299.
 Cæsar, L., Polished stones, 190.
 Cætani, V., Marble, 100.
 Caffrey, C. S., Vehicles, 299.
 Cagliani, L., Velvets, 419.
 Caille, Miss F., Faïence, 180.
 Caky, Baron de, Harness, 245.
 Calamari, P., Soaps, 217.
 Caldara, Salvatore, Cloths, 218.
 Calderara & Bankmann, Soaps, 192; Perfumery, 193.
 Calderon, P., Clay, 100; Books, 293.
 Calman, L., Books, 274.
 Calmann, C., Book, 260.
 Calvadas Lace Manufacturers' Exhibit, 184.
 Calver, G. W. H., Ironing machine, 297.
 Calvert, F. C., & Co., Acids, 141.
 Calvera, M., Medicine, 249.
 Caldwell, J. E., & Co., Silverware, 116; Jewelry, 127.
 Caldwell & Mather, Ranges, 295.
 Caldwell & Tod, Stone, 18.
 Caledonia Free Stone Company, 46.
 Caledonia New Amalgamated Company, 161.
 Caligny, A., Hydraulics, 275.
 Calise, T., Straw hats, 219.
 Callewaert Bros., Books, 286.
 Cambria Furnace, Iron ores, 14; Iron, 21.
 Cambria Iron and Steel Company, 13, 19.
 Cammell, Charles, & Co., Iron, 30.
 Cameron, W., & Son, Embroideries, 126.
 Camden Woolen Mills, 122.
 Campbell, C. J., Coal, 45.
 Campbell & Fowler, Springs, 178.
 Campbell, J., Carriages, 177.
 Campbell, Geo., Shutters, 177.
 Campbell, J., Books, 271.
 Campbell Brick & Tile Company, 143.
 Campbell, O. R., Painting, 154.
 Campbell, Samuel, Fluid extracts, 107.
 Campbell, W., Curtain rollers, 113.
 Campbell, Tucker, & Co., Coal, 16.
 Canada Car Co., Wooden ware, 177.
 Canada Cotton Manufacturing Co., 174.
 Canada, Geological Survey, 44.
 Canada Paper Co., 176.
 Canada Truss Factory, 173, 176.
 Canadian Titanic Co., Iron, 48.
 Canadiani & Biffi, Acids and chemicals, 216.
 Candido & Gonsalves, Soaps, 243.
 Cane, G., Tools, 220.
 Canton of Aargau, Assoc. of, Report, 282.
 Canterbury Flax Association, 164.
 Canson & Montgolfier, Paper, 185.
 Cantlie, Ewan, & Co., Flannels, 174.
 Cape Copper Mining Co., Copper, 167; Ores, 167.
 Cape Rouge Pottery Co., 173.
 Capponi Conti Bros., Olive oil, 216.
 Capra, J., Jewelry, 184.
 Carbon Iron Co., 15, 20.
 Carboy, D., Cutter, 178.
 Cardalda, J., Glycerine, 246.
 Cardalda, J., Pepsin, 249.
 Cardwell, R., Trepang, 162.
 Carenzo, N., Kaolin, 100.
 Carette Dobbels, D., Lightning rod, 287.
 Carey, Samuel, Millstones, 19.
 Carling, T., Wheat, 162.
 Carlisle, H., & Son, Combs, 128.
 Carlskrona Galvanizing Stock Co., 214.
 Carmant, A., Jewelry, 184.
 Carmichael, G. L. & J. B., Wines, 152.
 Carmoy, C., Nails, 186.
 Carnegu Bros. & Co., Iron, 20.
 Carney, B. L., Hats, 126.
 Caron, L., Dryer, 179.
 Carpenter & Raymond, Monuments, 17.
 Carr, Crawley, & Devlin, Hardware, 137.
 Carr, J., & Co., Woolens, 146.
 Carr, James, Granite ware, 112.
 Carr & Sons, Joinery, 153.
 Carr, W. S., & Co., Pumps, 298.
 Carrea, L., Argil, 97.
 Carrington, De Zouche, & Co., Decorations, 113.
 Carranza, E. A., Counterpane, 247.
 Carré, E., Electric machines, 275.
 Carrera, R. C., Bristle work, 247.
 Carreras, C. de, Matting, 246.
 Carreras, R. de, Carpet, 247.
 Carrigan, P., Bath tub, 298.
 Carrier, Miss H., Embroidery, 175.
 Carrier, Miss L., Lace, 175.
 Carroll, E., Ochre, 172.
 Carson, E. J., Ebony, 168.
 Carson & Brown Co., Paper, 130.
 Carter, A. A., Screens, 116.
 Carter, E., Tools, 135.
 Carter, H., Tools, 135.
 Carter, S. B. N., Medicine chest, 176.
 Carter, W. T., & Co., Iron ores, 15; Iron, 20.
 Cartier-Bresson, Cotton thread, 182.
 Carue, Ropes, 187; Gymnastics, 276.
 Carter, A. A., Ellipsograph, 261.
 Carter, Dinsmore, & Co., Inks, 109.
 Cartiera, J., Paper, 219.
 Cartwright, McCurdy, & Co., Iron, 21.
 Carvalho & Bro., Soaps, 243.
 Case Bros., Paper boards, 132.
 Case, Lockwood, & Brainard Co., Paper, 130.
 Case, W. V., Bro., & Co., Wagon materials, 299.
 Cassella, G., Shoes, 219.
 Casgrain, Tripoli, 47.
 Cashmore, T., Clay, 47; Bricks, 172.
 Cass, W. E., Carving fork, 297.
 Cassegrain, F. P., Firearms, 226.
 Cassell, Petter, & Galpin, Publications, 268.
 Casseres, A. de, Clock, 288.
 Cassinara, E., Billheads, 220.
 Castellane, A., Gold articles, 219.
 Castellani, T., Crockery, 218.
 Castelo, G., Herbs, 249.
 Costelvedere, L., Candelabra, 218.
 Canuer, A., Eagles, 192.
 Catalano, A., Furniture, 218.
 Catanzaro, G., Licorice paste, 216.
 Catamarca, Provincial Commission of, Salt, 245; Cotton, 247; Crotchet work, 248; Horse cloth, etc., 250; Vizcacha leather, etc., 250; Books, 293.
 Catamarca, Government of, Cottons, 247; Woolens, 247; Blankets, 247, 294.
 Catasaqua Iron Co., 20.
 Cathiard, Boots, 244.
 Cathrineholms Iron Works, 88.
 Cattaneo, A., & Brother, Paper, 219.
 Cavallaro, L. & G., Metallic Beds, 218.
 Cavaleri, A. M., Album, 219.
 Cavern & Button, Hinges, 177.
 Cayol & Neumann, Electricity, 294.
 Cazaubon, D., Pumps, 186.
 Cazin & Noyon, Laces, 184.

- Ceara, Province of, Oils, 243; Netting, 244.
 Cedar Hollow Lime Co., 18.
 Celluloid Manuf. Co., Toilet brushes, 128.
 Cenami, Count Bartolomeo, Olive oil, 216.
 Centennial Guide Book Co., Guide, 261.
 Centennial Safe Deposit Co., 266.
 Center Furnace, Empire Iron Works, Iron
 ores, 14; Iron, 21, 22.
 Central Glass Co., 113.
 Central Pianoforte Co., 265.
 Central Printers' Stock Co., 290.
 Central Soap Co., 108.
 Central Union of Fine Arts, Books, 274.
 Cerveny, Y. F., Instruments, 279.
 Cervera & Co., Files, 246.
 Cervin, C. G., Model, 239.
 Cesena Sulphur Co., 94.
 Chabert, J., & Co., Silks, 182.
 Chabin, H., Stained glass, 181.
 Chaco Argentine Commission, Cloth, 249;
 Arrows, 249.
 Chace Mills, Cottons, 120.
 Chaix, A., & Co., Books, 274.
 Chalamel, A., & Co., Woolen fabrics, 182.
 Chalfant Mfg. Co., Sad-irons, 297.
 Chamber of Com. & Arts, Stone, 94; Olive
 oil, 217.
 Chambers of Com. & Industry, Chart, 288.
 Chambers & Co., Umbrellas, 127.
 Chambers, T. F., Varnish, 142.
 Chameroy & Co., Pipes, 186; Scales, 274.
 Champion Fence Co., 137.
 Champion, G., Arrowroot, 152.
 Champion Spouting Spring, 19.
 Champromy, J. B., Foulards, 183.
 Chance Bros., Optics, 143.
 Chanudet, L., Pavement, 275.
 Chanute, O., Bridges, 265.
 Chapelle & Co., Blankets, 218.
 Chaplean, G., Safes, 173; Tools, 176.
 Chapman, Mrs. H. M., Braces, 124.
 Chapman Slate Co., 17.
 Chappée, A., Gas pipes, 181; Pipes, 186.
 Chapsal, A., Shoes, 184.
 Charageat, E., Umbrella, 185.
 Charbonne, Thuillier J., Cutlery, 186.
 Chardin, E., Sewing silks, 183.
 Charleroi Iron Mfg. Joint Stock Co., 74.
 Charles, A., & Co., Gloves, 230.
 Charleston, S. C., Mining Co., Phosphates, 19.
 Charlotte Furnace Co., Iron ores, 14; Iron, 22.
 Charnaux, F., Photographs, 286.
 Charpentier & Co., Books, 274.
 Chase, F. & P. F., Galvanized iron, 139.
 Chase, J. L., Paste, 130.
 Chastel & Co., Hats, 244.
 Chatain, H., Oven, 296.
 Chateau, L. A., Emery paper, 186.
 Chatelain de la Cour, A., Watches, 282.
 Chatten, M., & Co., Cloth, 203.
 Chaux-de-Fonds, Municipality of, Plans, 283.
 Chemical Factory, Leopoldshall, 60; Stass-
 furt, 60.
 Chemistry Association, Drugs, 237.
 Chemical Technical Manuf., Porcelain, 193.
 Cheney Brothers, Silks, 124.
 Cherif Paeba, 223.
 Chervin, Stammer cure, 274.
 Cheshbrough Manuf. Co., Pomades, 129.
 Cheshire Manufacturing Co., Buttons, 129.
 Chessman, W. H., Lime, 108.
 Chester, S., Engineering, 266.
 Chevrier, Pharmaceutics, 179.
 Chiavari, Agrarian Commit. of, Olive oil, 217.
 Chickering & Sons, Pianos, 265.
 Chicopee Manufacturing Co., Cottons, 118.
 Chief Mountain and Mining Adm'nstration, 66.
 Chiericoni, Ugolino, Cocoons, 218.
 Chiesa Bros., Braids, 200.
 Chiffroy, A., Prints, 182; Woolen fabrics, 182;
 Silk prints, 183.
 Childs, G. K., Buggy, 299.
 Chinnery, C., Fibres, 165.
 Chinic, E., Steel, 48.
 Chipman Bros., Tools, 176.
 Chipman, D., Magnetite, 45.
 Chipman, G. W., & Co., Carpet lining, 123.
 Chiroux, L., Blacking, 179.
 Chiris, A., Perfumery, 180.
 Chisholm, W., Trunks, 175.
 Chivot, N., Oils, 179.
 Chormann & Co., Easels, 114.
 Chovet, L., Pictures, 181.
 Chowne, E. G., Sugars, 152.
 Chown & Cunningham, Stoves, 174.
 Chrome Steel Co., 21.
 Christiania Millstone Manufacturing Co., 88.
 Christoffe & Co., Goldsmiths' ware, 186.
 Christen, J. J., Books, 281.
 Christensen, C., Carryall, 216.
 Christesen, V., 208; Jewelry, 209; Silver-
 ware, 209.
 Christian, J. F., 191.
 Christiania Doorhandle Works, 215.
 Christiania Match Factory, 214.
 Christiania Sail Cloth Manufactory, 215.
 Christoffersen, C., Pulp, 215.
 Christy's, W. M., Sons, Blank books, 131.
 Chuck, T. F., Photographs, 155.
 Chultre, C., Surgical appliances, 176.
 Churchill, E., Roofing felt, 131.
 Cirbonneaux, F., Jewelry, 184.
 City Orphan Asylum, Reports, 285.
 Claasen, P. C., jr., Paints, 205.
 Claesen, Ch., Art, 286.
 Clark & Co., Hardware, 138.
 Clark & Crompton, Wines, 162.
 Clark, C. W., Window shades, 116.
 Clarke Combination Lock Co., 139.
 Clark, E. P., Model, 268.
 Clarke, F. L., Hawaiian curiosities, 242.
 Clark, F., & Sons, Ores, 101.
 Clark, H. F., Dentures, 134.
 Clark, J., Leathers, 156.
 Clark, J., jr., Spool cotton, 145.
 Clarke, R., Silver rings, 249.
 Clark, Reeves & Co., Bridges, 262, 265.
 Clark, S., Hat fitting apparatus, 126.
 Clark Thread Company, 118.
 Clark, T. L., Nickel ware, 178.
 Clark, J., & Sons, Bark, 155.
 Clarke, U. E., & Co., Trunks, 175.
 Clark, Wm., & Co., Iron, 20.
 Clark, W. A., Tools, 135.
 Claus, Prof. C., Treatise, 292.
 Claus, Heinrich, & Gross, 279.
 Clauseau, Father & Son, Extract, 179.
 Claxton, R., Jewelings, 269.
 Claxton, Remsen, & Haffelfinger, Books, 260.
 Clay, R., Instruments, 148.
 Clayton, Marsdens, Holden, & Co., Silks, 146.
 Clear, E., Flour, 169.
 Cléray, E., Jewelry, 184.
 Clement & Co., Precious stones, 184.
 Clement, R., Artificial limbs, 133.
 Clery, H., Pharmaceutics, 179.
 Clever, J., Chemicals, 187.
 Cleveland, H. W. S., Design, 266.
 Cleveland Non-explosive Lamp Co., 117.
 Cleveland Malleable Iron Co., 22.
 Cleveland Rolling Mill Co., 13, 19.
 Clickerman, L. M., Embroideries, 127.
 Cliff, J., Firebrick, 143.
 Clifford, Mrs., Frame, 173.
 Clinton, E., & Co., Brushes, 139.
 Clinton Manufacturing Co., Cottons, 119.
 Clinton Wire Cloth Co., 118.
 Clinton Furnace, Iron ores, 14; Iron, 21.
 Clinton Mfg. Co., Shirts, 120.
 Close, T. J., Settees, 115.
 Cloth Manufacturers' Association, 194.
 Clough Stone Co., 18.
 Clough & Warren Organ Co., 265.
 Cloutier, G., Boots, 175.
 Clum, H. A., Aëliograph, 261.
 Coates, L., Ferns, 165.
 Cobourg & Petersburg Iron Co., 45.
 Coburn Mfg. Co., Wardrobes, 115.

- Cochran, John M., Coal, 16.
 Cochran, R. C. E., Drawings, 269.
 Cockburn, D., Frame, 173.
 Coco, S., Ebony furniture, 218.
 Codman & Shurtleff, Surgical instruments, 134.
 Coenen & Wolter, Cottons, 189.
 Coffani, M., Parasols, 197.
 Coffin, Redington, & Co., Silica, 19.
 Cohansey Glass Mfg. Co., 112, 117.
 Cohen, C. J., Pencil leads, 130.
 Cohen & Levy, Flour, 152.
 Cohen & Risch, Books, 276.
 Cohn, E., Table covers, 190.
 Cohn, M., & Co., Corsets, 125.
 Cohné, J., Soaps, 141.
 Cohumer & Collet, Furniture, 185.
 Coez, E., & Co., Paints, 179.
 Coignet, Father & Son, & Co., Chemicals, 179.
 Colange, Leo de, Indicator, 274.
 Colac, Shire of, Photographs, 155.
 Colas, E., Essence of roses, 180.
 Colby Wringer Co., 297.
 Coldbrook Rolling Mills, Iron, 48.
 Coldbrook Rolling Mills Co., Nails, 177.
 Cole, A., Furniture, 113.
 Cole & Ballard, Velocipedes, 300.
 Coleman Eagle Bolt Works, 138.
 Cole, R., Copper glance, 44.
 Cole, W., & Son, Arrowroot, 152.
 Coleman & Garnishlock, Salt, 171.
 Coleman, W., Gypsum, 47.
 Colgate & Co., Soaps, 111.
 Colin & Co., Books, 274.
 Colinet, E., Art, 286.
 Collender, H. W., Billiards, 113.
 Collet, R., Map, 291.
 Colliet Désire, St. I., Watches, 282.
 Collin, C., Watch glasses, 199.
 Collins & Co., Swords, 132; Steel tools, 134.
 Collins & Sturgeon, Chair, 115.
 Collinson & Lock, Furniture, 144.
 Collison, H. C., Wine, 168; Cognac, 169.
 Collman, L. W., Pianos, 269.
 Collyer, Fairbairn, & Co., Hats, 175.
 Colné, J. P., Glass machinery, 112.
 Colonial Museum, Minerals, 40; Barks, 164.
 Colonial Sugar Refining. Co., 152.
 Colton, E. S., Refrigerators, 297.
 Colt's Patent Firearms Mfg. Co., 132.
 Colton, J. W., Flavors, 111.
 Columbian Marble Co., 17.
 Columbia Slate Co., 17.
 Columbia Spring Co., Flannels, 123.
 Coldwell, F. E., Frames, 116; Gloves, 126.
 Colyer, J., & Co., Vehicles, 299.
 Comellini & Buratti, Corsets, 219.
 Comminassi Brothers, Gun barrels, 220.
 Com. of Aguas Corrientes, Lime, 100.
 Com. Dept. of Paraná, Clay, 100.
 Company for Telegraph Supplies, 188.
 Comport, H., Tomato sauce, 157.
 Comstock, Castle, & Co., Stove, 296.
 Comstock Dickinson Ivory Co., 129.
 Conard, A. J., Boring implements, 135.
 Conceiro, Violin, 293.
 Concord Granite Co., 17.
 Condell, J., & Son, Artificial limbs, 133.
 Conn & Dupont, Musical instruments, 265.
 Connecticut, State of, Pupils' work, 258.
 Connor, J., Oats, 156.
 Conner, T., & Sons, Cords, 177.
 Conrad Bros., Shirts, 125.
 Continental Mills, Cottons, 118.
 Consolidated Fruit Jar Co., 297.
 Conti, E., & Sons, Soaps, 217.
 Continental Manufacturing Co., Inks, 110.
 Conover, J. A., & Son, Spring horses, 300.
 Constant, E., Iron, 74; Bolts, 204.
 Contucci, E. M., Olive oil, 216.
 Convent of Good Shepherd, Lace, 175; Baskets, 177.
 Converse, J. A., Gypsum, 47.
 Conway, William, Soaps, 108.
 Condit, Hausen, & Co., Chemicals, 107.
 Coocy, J. G., Apparatus, 295.
 Cook, Caleb, Oils, 109.
 Cook, Isaac, Lead ores, 13.
 Cook, J., Rugs, 163; Mats, 164.
 Cook, N., Umbrellas, 128.
 Cook, W. A., Shade fixtures, 116.
 Cooke Bros., Pins, 148.
 Cool, G., Mantels, 205.
 Cooke, G. K., & Co., Hand stamps, 129.
 Coon & Van Volkenburgh, Collars, 126.
 Cooper & Holt, Furniture, 144.
 Cooper, Hewitt, & Co., Iron ores, 15; Iron, 20.
 Cooper, R., Washing crystals, 171.
 Cooper & Co., Inks, 142.
 Cooper & Campbell, Carriage, 178.
 Cooper, J. W., & Bro., Cabinetware, 114.
 Co-operative Iron and Steel Co., 41.
 Cooppal & Co., Charcoals, 201.
 Copenhagen Leather Co., 210.
 Copeland, Geo., Twine, 177.
 Copeland, G. A., Cartridges, 148.
 Copeland & McLaren, Clay, 47; Oxide, 172; Wire brushes, 177.
 Copley Cement Co., 18.
 Copp Bros., Stoves, 173; Enameled ware, 176.
 Coppen, F., Paintings, 168.
 Corady, J. de, Millinery, 184.
 Corbett, J., Salt, 141.
 Corbin, P. & F., Hardware, 137.
 Corbon, Lamps, 181.
 Corcelle, J., & Co., Watch dials, 282.
 Cordes & Ellgass, Corks, 192.
 Cordoba, Prov. Com. of, Lead, 99; Blankets, etc., 247; Embroidery, shoes, 248; Trunks, tinder box, 249; Harness, dusters, medicinal herbs, 250; Maps, laws, 294.
 Cordoba University, Minerals, 99.
 Corestine, J., & Co., Hats, 175.
 Corfield, O. A., Artificial teeth, 134.
 Corica, A., Shot, 220.
 Corliss Safe Co., 115.
 Cornejo, M., Lime, 100.
 Cornejo, F., Waters, 101.
 Cornelius & Sons, Gas fixtures, 117.
 Cornell, J. B. & J. M., Iron work, 139.
 Cornell & Shelton, Paper boxes, 131.
 Cornell, S., Compass, 272.
 Corush & Co., Buoys, seats, belts, 155.
 Cornish, T. E., Electric batteries, 263.
 Cornu, E., & Co., Bronzes, 181, 186.
 Corrientes, Prov. Com. of, Stones, 100; Yarns, 247; Hats, 248; Laces, 248; Lances, 249; Books, 293; Laws, 294.
 Cosentini & Caruso, Extract of licorice, 217.
 Coshocton Stone Co., 18.
 Corsini, Prince Tommaso, Olive oil, 217.
 Corticino Patent Floor Covering, 146.
 Coryn, J., Wigs, 204.
 Cossard, Laces, 184.
 Costa, S., Artificial teeth, 245.
 Costenoble, H., Books, 276.
 Costerfield Gold and Antimony Mfg. Co., 35, 36.
 Costermans, J., Hearth, 202.
 Costermens, C., jr., Trunks, 206.
 Coston, M. I., Signals, 263.
 Coston, W. F., Signals, 263.
 Cotta, J. G., Books, 276.
 Cottier, C., & Son, Imitation precious stones, 127.
 Cotton, A. J., Tools, 135.
 Coulter, J., Clay, 47; Bricks, 172.
 Count Aristide, Waters, 94.
 Count, V. Thun, China, 193; Porcelain, 193.
 Cousin, P., Maps, 272.
 Cuvreux, W., Shears, 186.
 Court, P. W., Wool, 169.
 Cour, Roseaux, Oils, 179.
 Cove, J. A., Gypsum, 47.
 Covey, J. H., Boiler, 296.
 Cov, G. T., & Co., Utensils, 173.
 Covil, E. R. N., & Co., Nails, 177.
 Cowan, A., Hematite, 45; Chemicals, 171.
 Cowan, T., & Co., Flour, 162.
 Cowell, J. J., Hardware, 138.

- Cowles, C., & Co., Carriage trimmings, 298.
 Cowperthwait & Co., Books, 257.
 Cox Bros., Jutes, 145.
 Cox, Justice, jr., & Co., Iron, 21.
 Cox & Sons, Furniture, 144.
 Coyne, Geo. S., Chemicals, 107.
 Crab Orchard Iron Co., 13, 20.
 Crabb, R. S., Copper, 161.
 Cragin, I. S., & Co., Soap, 108.
 Craig & Rose, Oils, 141.
 Cramer, J. W., 188.
 Cramer, H. G. D., Pasteboard, 206.
 Crandall, C. J., Crutches, 134.
 Crane & Co., Paper, 130.
 Crane Iron Co., 15, 20.
 Crane, S. O., Wheels, 298.
 Crassler & Co., Laces, 184.
 Craven, Dunell, & Co., Tiles, 143.
 Crawford Bros., Baking powder, 108.
 Crawford, J. D., Hematite, 45.
 Creamer, W. G., & Co., Ventilators, 295.
 Cream tartar fruit, 230.
 Crescent Mills, Paper, 130.
 Cressier, E., Watches, etc., 274.
 Crest, M., & Co., Pack saddle, 250.
 Creswick, Council of, Photographs, 155.
 Crevecar, H. S. I., Statistics, 286.
 Crew, Moore, & Levick, Oils, 109.
 Crezier, D. W. C., Models, 266.
 Crippa, F., Wine, 157.
 Crispo, M. C., Limestone, 94.
 Croaker, Scott, & Co., Antimony, 36.
 Crocker, L. O., Ticket punches, 301.
 Crockery Society of Farina, Artistic crockery, 218.
 Croes, J. J. R., Engineering, 266.
 Croft, W., & Co., Rubber stamps, 130.
 Crofut & Knapp, Hats, 126.
 Crommelinck, Lace, 204.
 Crompton, J., & Co., Paper boxes, 131.
 Crooks, A., Educational Department, 271.
 Croon Bros., Cottons, 189.
 Cross, R., & Son, Toothpicks, 128; Pens and pencil cases, 130.
 Crossley, J., & Sons, Carpets, 146.
 Crossman, A. W., & Son, Tools, 135.
 Crothers & Wilson, Sulky, 178.
 Crotta, G., Music, 292.
 Crouch, H., Microscopes, 269.
 Crown Perfumery Co., 142.
 Crowther, D. W., Dentistry, 134.
 Cruickshank, J. D., Woods, 164.
 Crystal Glass Co., 113.
 Cgank & Co., Blinds, 194.
 Culbeck, W. H., Harness, 178.
 Cull, C., Mangle, 174.
 Cull, H., Furniture, 297.
 Cumberland Nail and Iron Co., 20.
 Cummings, J. S., & Co., Neck wear, 125.
 Cummins, Henry, Violin, 264.
 Cuña, A., Agate, 99.
 Cunningham, E., 232.
 Cunningham, James, & Co., Vehicles, 299.
 Cunningham, P. B., Coal table, 115.
 Cunningham, P. & C., Wheat, 164.
 Cunningham, Portz, & Co., Wagon materials, 299.
 Currie, J., Wools, 157.
 Currie & McVean, Hubs, 178.
 Curtis, J. W., Painting, 154.
 Cutler, A., & Son, Desks, 114.
 Cutter, E., Chairs, 113; Invalid chair, 134, 295.
 Cuypers, J. F., Piano, 288.
 Cwmorthin Slate Co., 29.
 Cyrette, A., Ores, 44.
 Czerminska, I., Embroidery, 195.
 Dabert & Co., Wool fabrics, 182.
 Dagand, E., Coffee-pots, 181.
 Daggett, C., Gloves, 147.
 Dale, Dr., Wax, 168.
 Dale Manufacturing Co., Silk Braids, 124.
 Dalechamp, J., Laces, 184.
 Dalla, P., Silks, 219.
 Dalton Bros., Wheat, 151; Flour, 152.
 Dalwood, W. F., Guano, 163.
 Damon, S. G., "The Friend," 242.
 Damon, Smith, & Co., Flannels, 122.
 Dana, E. A., Projectiles, 132.
 Danberger, G., Fancy articles, 197.
 Danks, J., Valves, 154.
 Daniell, A. B., & Son, Porcelain, 143.
 Daniels, T. E., Marble, 15.
 Daninos, M., 223.
 Danish Preserved Butter Co., 210.
 Danville Iron Co., 20.
 Danville School Slate Co., 46.
 Danville Slate Co., 46.
 Darebin Shire, Council of, Photographs, 155.
 Darrach, S. A., Crutch, 133.
 Dartmouth Rope Work Co., 177.
 Dash, O., Hats, 147.
 Dassonville, Lace, 204.
 Date's Patent Steel Co., Tools, 176.
 Daubin & Co., Fly paper, 179.
 Davoll Mills, Cottons, 120.
 Davenieré, E., jr., Laces, 184.
 Davenport, S., Oil, 161; Woods, 162; Wines, 163.
 Davey, W. O., Boxes, oakum, 131.
 David, Damoiseau, & Co., Chains, 186.
 David, J. B., Ribbons, 183.
 Davids, T., & Co., Inks, 109.
 Davidson, H. A., Gypsum, 47.
 Davidson, T., jr., & Co., Pipes, 143.
 Davidson, W., Copper Glance, 44.
 Davies, R. S., & Sons, Woolens, 146.
 Davis, Isaac, Granite ware, 112.
 Davis, T. C., Cordials, 163.
 Davis, J., Window sash, 153.
 Davis, J. T., Artificial eyes, 134.
 Davis Level & Tool Co., 135.
 Davis, O. W., jr., Ores, 13; Iron, 20.
 Davis & Wilson, Whips, 147.
 Daye, F., & Co., Leather, 204.
 Dawson Bros., Blank books, 176.
 Dawson, S. J., Ores, 44.
 Day & Frick, Soap, 109.
 Dean, H., Stoneware, 143.
 Debenhaw & Freebody, Gloves, 147.
 De Bock, M., Cabinetware, 115.
 De Brandt, J., Linens, 203.
 De Bruycker, T., & Co., Men's wear, 203.
 Debrus, L., Boxes, 202.
 Debrus, W. A., Boxes, 202.
 Decaux Son, Cloths, 182.
 Decew, W., Sandstones, 46; Limestone, 46.
 Declercq, C., Thread, 203; Lace, 204.
 Decol, M., Medicine, 220.
 De Costa, D. R., Tooth wash, 111.
 De Dorlodot, L., & Co., Glass, 202.
 Deetz, E., Retiring room, 114.
 De Francisca, Colony of, Furniture, etc., 244.
 Defreune, H. J., Blinds, 116.
 Degefors Stock Co., Ores, 84; Iron, 85.
 Degman, Thos., Glass shades, 112.
 Degraives, C. & J., Wool, 157.
 De Groote, V., Lace, 204.
 De Hemptinne, A., Acid machine, 201.
 Dehors, A., Toys, 185.
 De Jean, E., Tools, 204.
 Dejonge, L., & Co., Paper, 132.
 De Komrick Bros., Pottery, 201.
 De Lambert, A., Files, 204.
 Delamotte, Mongrenier, Merinos, 182.
 De Lange, A. G., Rugs, 205.
 De Lanos, J. R., Poncho, 247.
 Delaware Chair Co., 113.
 Delchevalerie, 223.
 Delettrez, A., Perfumery, 180.
 Delhez Bros., Cloth, 203.
 Delius, C., Cloths, 189.
 Delivré, L., Artificial flowers, 185.
 Della Casa Nicola, Baveno, Granite cornice, 218.
 Dellachia, A. M., Matches, 218.
 De Looper, Haidint, & Co., Glass, 202.
 De los Sautos, F. A., Stone, 99.
 Demanet, A., Nails, 204.

Demar, L., Dress goods, 182.
 De Marlaix, A., Essences, 201.
 Demartine, T., Soap, 192.
 Demestre, E., Maize, 151.
 Demorest, Mrs., Fashions, 125.
 Demuth, W., & Co., Show figures, 137.
 De Nava, Guiseppe di P., Essences, 217.
 Denham, T. M., & Bro., Shirts, 125.
 Denis, Wound dressings, 204.
 Denizet, Cutlery, 186.
 Dennison & Brown, Wood pulp, 131.
 Dennison & Co., Paper boxes, 131.
 De Notaris, S., Shoes, 219.
 Denton, Drake W., Slate, 17.
 Deny, L., Construction materials, 186.
 Dephlangue, Sr., Whetstones, 186.
 De Poli Brothers, Church bell, 220.
 Deppler, J., Wine, 157.
 Derby, P., Chairs, 115.
 Derby Silver Co., 116.
 Derepas, R., Gum, 151.
 Derepas, W., Timber, 151.
 De Richelieu, Mrs. F., Ornaments, 154.
 De Ruyt, D., Carriages, 204.
 De Ryckere, E. S., Brushes, 204.
 Deschamps, Maurey, & Co., Brushes, 185, 187.
 Des Cressonières & Son, Soap, 201.
 Desespriugalle, A., Son, Chemicals, 201.
 Desfeux, P., Leather roofing, 185.
 De Sieto Bros., Essences, 217.
 De Silvestri, Silks, 219.
 Des Mares, P. T., Lace, 204.
 Desmet Bros., Fabrics, 202.
 De Smet, E., & Co., Thread, 202.
 Desmoes, P., & Son, Rum, 171.
 Desoto Alkali Co., 141.
 Desouches, Carriages, 187.
 Dessauer, A., Papers, 191.
 Dessent, J., & Bros., Glass, 202.
 Déteimmerman, P., Porcelains, 180; Porcelain flowers, 185.
 De Tournay, C., Paper, 204.
 Detroit Polish Co., 19.
 Deutsch, A., Oils, 179.
 De Vergniess, O., & Sisters, Lace, 204.
 Devine, T., Galena, 45.
 Devlin & Co., Clothing, 125.
 Devoe, C., & Bro., Stuffs, 203.
 Devoe Manufacturing Co., Oils, 109.
 Devosse, B., Cloth, 203.
 Dewhurst, J., & Sons, Sewing cotton, 145.
 Dewidels, S., Kid gloves, 195.
 De Witt, G., Bro., & Co., Wire fabrics, 118.
 De Witt, Morrison, & Kelley, Tools, 135.
 De Wolfe, J. M., Vehicles, 178.
 Dexter & Co., Mica, 13.
 Dexter, C. H., & Sons, Paper, 131.
 Dexter, Lambert, & Co., Silks, 124.
 Deyhle Bros., Metal ware, 191.
 Diamante, Sub-Com. of the Dep't of, Stones, 99; Cement, 100.
 Diamond Glass Co., 112.
 Diaz, E., Stone, 100.
 Dias, Cordage, 245.
 Dibel, H., Wagon, 178.
 Dickinson, Mrs. C. J., Wax flowers, 128.
 Dick & Kirschten, Axles, 192.
 Dickson, J. B., Corals, 242.
 Dickson, W. W., Skins, 168.
 Dickson, M., Photos. of Island scenes, 243.
 Dickson, J., & Co., Wood work, 212.
 Dickson, W. W., Oxide, 167.
 Dicksons, Furguson, & Co., Linens, 145.
 Didout, H., & Son, Clasps, 185.
 Diedek's Son, A. C., Soaps, 192; Perfumery, 193.
 Diena, M. G., Silk, 219.
 Dienheim-Brochocki, T. O., Disinfector, 181.
 Dier & Diets, Skins, 168; Wool, 169.
 Dieutegard, E. & E., Trimmings, 184.
 Dillman, I., & Fischer, L., Iron furniture, 193.
 Dily, E., Sulphur, 94.
 Di Mauro, F., Cream of Tartar, 216.
 Dingeldein Bros., Silverware, 190.

Diniz, J., Artificial Teeth, 245.
 Direc. Gen. of the Col. of Mucury, Minerals, 97.
 Director of Botanic Gardens, 155, 156.
 Director of Prison, Matting, 205.
 Di Rosalia, A., Shoes, 219.
 Di Salvo, S., Olive oil, 217.
 Dissoire, Instruments, 186.
 Ditten, H. S., Pills, 215.
 Dixon, A. H., Show cards, 173.
 Dixon, C. A., Engraved cards, 131.
 Dixon Crucible Co., 18, 112; Pencils, 129.
 Dixon, Frederick, Patent fuel, 29.
 Dixon, Smith, & Co., Sash fastener, 177.
 Dixon, T. S., & Sons, Grates, 137.
 Dixon, W., Carriages, 177.
 Djupafors Mnf. Co., Pasteboard, 213.
 Dladen, T., Oil, 246.
 Doan, W. H., Oils, 109.
 Dobbe, J. P., Painting, 206.
 Dobbins, R. J., Main Ex. Building, 118.
 Dobel, P., Ozocerite, 192.
 Dobelman, J. B., Glassware, 112.
 Dobson, J. & J., Carpets and woolens, 122.
 Docker, F. G. & J. B., Wine, 157.
 Dodd, A. W., & Co., Cod liver oil, 109.
 Doerfel, C. G., Sons, Kid gloves, 190.
 Doerr & Sloan, Phosphates, 107.
 Doettinger, J., Coverlets, 189.
 Dognin & Co., Laces, 184.
 Dogny, J. B., Balusters, 202.
 Dolne, Lekeux, & Co., Cloth, 203.
 Dolphin Manufacturing Co., Barytes, 45.
 Domeuter, L., Son, Furniture, 202.
 Dominion of Canada Plumbago Co., 47.
 Dominion Suspender Co., 175.
 Domken Bros., Cloth, 203.
 Donaghy, M., Ropes, 154.
 Donaldson, J. W., Block stamps, 135.
 Donaldson, T. B., Gold quartz, 44.
 Donato, F., Child's suit, 248.
 Donovan, J. W., File covers, 130.
 Dons, H. C., Matches, 214.
 Dopp, G., Amethyst, 85.
 Dor. U. Free Stone Co., 46.
 Dorman Manufacturing Co., Baskets, 139.
 Dornan Bros. & Co., Carpets, 123.
 Dorner, E., Laces, 195.
 Dornon, L., Silk gauzes, 183.
 Doty, H. H., Oil burner, 117.
 Doucet, E., Writing fluids, 246.
 Dougall, J. D., Firearms, 148.
 Dougherty, A., Playing cards, 131.
 Dougherty, D. A., Inks, 109.
 Dougherty, E. D., Marble, 17.
 Douglas Axe Manufacturing Co., 135.
 Douglas, B. W. B., Potash, etc., 60.
 Douglas, D., Lime, 46; Grindstones, 47.
 Douglas, Dr., Ore, 44.
 Doulton, H., & Co., Terra cotta, 143; Mantel pieces, 143.
 Doulton & Watts, Tiles, 143.
 Doux, E., & Co., Silks, 183.
 Dover Fire Brick Co., 18.
 Dowling, W., Centre flowers, 155.
 Drags Stock Co., Wool fabrics, 212.
 Drammen Foundry & Chemical Works, 218.
 Draper & Sons, Earth closets, 153.
 D. R. Barton Tool Co., 135.
 Drechler, J., Glass, 189.
 Dredge, A., & Co., Stationery, 175.
 Dreer, Smith, & Dreer, Gas apparatus, 117.
 Dreifus, S., Zephyr goods, 126.
 Drescher & Kiefer, Silver ware, 190.
 Dressel, Cuno, & Otto, Toys, 191.
 Dressler, E., Decorative Glass ware, 193.
 Dress Reform Co., Clothing, 126.
 Drew, E. B., 232.
 Dreydopple, Wm., Soap, 108.
 Dreze, H. & J., Cloth, 203.
 Dreyfus, J. G., & Co., Acids, 107.
 Drogue & Monnare, Poplins, 182.
 Droste & Siepermann, Cottons, 189.
 Drown, W. A., & Co., Umbrellas, 127.

- Droz, Juillet, & Co., Poplins, 182.
 Druelle, Wines, 179.
 Drum Cabinet Mfg. Co., 173.
 Dryfoos, L., & Co., Skirts, 121.
 Duart, Dias, Drugs, Oils, 243.
 Dubernet, L., Gilt frames, 115.
 Duboise, C., Chemicals, 179.
 Dubois, G., Boots, 184.
 Dubourguet, Stationery, 185.
 Ducro & Co., Meat extract, 179.
 Duden Bros., Lace, 204.
 Dudgeon, Arthur, Peat fuel, 29.
 Dugeon, A., Papers & pulp, 148.
 Du Faur, E., Timber, 151.
 Dufour & Co., Bolting cloth, 199.
 Dufourmantel, P., & Co., Wool warps, 182.
 Dugoujon, J., sr., Saws, 186.
 Duhamel, Dr., Iron pyrites, 45.
 Dujardin Bros., Hosiery, 203.
 Duinas, Mrs. F., Emery cloth, 186.
 Dumortier & Cuignet, Cloth; Tickings, 182.
 Dunbar, G., Limestone, 46.
 Dunbar, Hobart, & Whitden, Tacks, 137.
 Dundar, McMaster, & Co., Linen thread, 146.
 Duncan, John W., Pig metal, 20; Iron ores, 15.
 Dunckley & McBride, Sash lines, 156.
 Dundas Cotton Mills Co., 174.
 Dunlap & Co., Hats, 126.
 Dunn & Hunt, Oil cloths, 121.
 Dunn, E. J., Maps, 168.
 Dunn, J., & Co., Flour, 163.
 Dunn, Robert, & Co., Clays, 29.
 Dunraven, the Countess of, Embroidery, 147.
 Dunton, Jacob, & Co., Pills, 107.
 Duplan, Hamot, & Co., Furniture, 181; Car-pets, 182.
 Dupont, L., Covering, 182.
 Dupont, A., Brushes, 185, 187.
 Dupont Manufacturing Co., Paper, 175.
 Dupuy, B., Pharmaceutics, 204.
 Duquesne Glass Manufacturing Co., 113.
 Durand & Hugrienin, L., Chemicals, 199.
 Duranti, A., Straw hats, 219.
 Durham Iron Co., 15, 20.
 Durlen, Oetli, & Co., Milk powder, 201.
 Durrschmidt, Whetstones, 186.
 Duryee & Hallett, Furs, 129.
 Duval, H. H., Iron ore, 45.
 Dwight Manufacturing Co., Cottons, 119, 120.
 Dyer ville Manufacturing Co., Cottons, 119.
 Dyot, M. B., Street lamps, 117.
 Dysart & Co., Coal, 17.
 Dzudzinski & Hanuch, Bronze articles, 197.
 Eagle Furnace, Iron ores, 14; Iron, 22.
 Eagle Lock Co., 138.
 Eagle Pencil Co., 130.
 Eames, Prof., Silver veinstone, 114.
 Earle, J. S., & Co., Tables and mirrors, 115.
 Earnshaws, H., Photographs, 266.
 Eastern Kentucky Railway, Coal, 17.
 Easthampton Rubber Thread Co., 139.
 Eastman & Brooke, Soaps, 109.
 Easton Lock Works, 138.
 Eastwood & Co., Bricks and cement, 29.
 Eavenson, Jones, & Sons, Soaps, 108.
 Eberhardt, China ware, 193.
 Eche & Son, Oilcloth, 215.
 Eckelt, C., Turners' work, 197.
 Echuca, Council of, Photographs, 155.
 Echeverria, C., Minerals, 99; Pitchers, 246; Cottons, 247.
 Ecker, A., Colors, 192.
 Eckstein Bros., Kid gloves, 194.
 Eckstein & Kahn, Linens, 189.
 Eddy, G. M., Measuring tapes, 252.
 Eddy, G. M., & Co., Saws, 135.
 Eddy's, J., Sons, Woolens, 122.
 Edeline, A. J., Stones, 186.
 Edgar Thompson Steel Co., 20.
 Edge & Sons, Wire ropes, 29.
 Edgecomb, J., & Son, Sleighs, 178.
 Edgerton, N. H., Stereopticons, 263.
 Edgett, W., Ochre, 172.
 Edgren, J., Wall paper, 213.
 Edison, Thos. A., Telegraph, 263.
 Edsall, D. A., Hand stamp, 130.
 Education, department of, Books, 242.
 Edward, W., Cordages, 177.
 Edwards, G., Window sash, 145.
 Edwards, J., China ware, 143.
 Egan, J., Guns, 176.
 Egerer, A., Embroidery, 195.
 Egger, L. B., Veneers, 198.
 Eggington, J. A., Glass-ware, 173.
 Eggins, J., Maize, 151.
 Egli, F., Wine, 157.
 Egli & Sennhauser, Bolting cloth, 199.
 Egyptian National Museum, Cairo, Veterinary instruments, 225; Saddlery, 225.
 Ehret, M., jr., Roofing, 117.
 Eich & Co., Braids, 200.
 Eichhorn, G., Wines, 230.
 Eichler, E. D., Terra-cotta, 193.
 Eichman & Co., Paper, 197.
 Eichner, G. L., & Son, 191.
 Eiermann & Tabor, 188.
 Eiseman, S. M., Electrics, 163.
 Eisenfuhr, W., Tools, 191.
 Ek, J. A., Equipments, 212.
 Ekman, C., Ores, 84; Iron, 85.
 Ekman, C. D., Pulp, 213.
 Ekman, C. L., Inks, 211.
 Ekman, Finspong, & Maré, Shot, 213.
 Elastic Truss Co., 133.
 Eldarts, T. E., Arrowroot, 243.
 Elder, W. & N. G., Wools, 157.
 Eldridge & Bro., Books, 261.
 Elgin Nat. Watch Co., Tools, 134; Materials, 262.
 Eley Bros., Cartridges, 142.
 Elfring, C. E., Wick-cutters, 212.
 Eliaers, A. E., Seats, 181; Invalid chairs, 186.
 Elias, E., 223.
 Elias, J., Napkins, 205.
 Elkington & Co., Works of art in metal, 144.
 Elli, L., Seats for theatre, 218.
 Ellin, Robt., & Co., Carvings, 115.
 Elliot, J. W., Stoves, 173.
 Elliott, T. C., Washing machine, 174.
 Ellis, J. F., Leather goods, 175.
 Ellis Manufacturing Co., Supporters, 126.
 Ellis, Knapp, & Co., Umbrellas, 127.
 Ellis, T. G., Engineering, 266.
 Elmira Nobles Manufacturing Co., Tools, 135.
 Elstatter & Urbino, Gloves, 190.
 Emaus Iron Co., 15, 20.
 Emerald Hill, Council of, Photographs, 155.
 Emerson Piano Co., 264.
 Emery, C. E., Hydraulics, 266.
 Emmanuel, F., Cream of tartar, 216.
 Emond, V. A., Tools, 176.
 Emory, J., Twines, 118.
 Empire China Works, 112.
 Empire Iron Works, 22.
 Empire City Watch Co., Watches, 262.
 Emsley, R., Limestone, 46.
 End-Ulmi, A., Undergarments, 200.
 Enders, F., Leather articles, trinkets, 197.
 Engelmuller, F., Gloves, 194.
 Engert, A. O., & Co., Mouldings, 144.
 Engert & Rolfe, Felts, 146.
 English, J., & Co., Needles, 147.
 Engström, J., Razors, 214.
 Ennis, J. P., Table, 114.
 Enological & Agrarian Society of Acireale, Essence of lemon, 217.
 Enthoven, H. S., Utensils, 206.
 Entre, Rios, Waters, 250.
 Entre Rios, Province of, Embroideries, 249; Herbs, 250.
 Entz, H., Ranges, 181.
 E. N. Welch Manufacturing Co., Clocks, 262.
 Eraku, Z., Porcelain, 237.
 Erchkens, J., Sons, Cloths, 189.
 Erckens & Son, Cottons, 189.
 Ercklentz, Max, & Co., Cottons, 189.

- Ercklentz & Reuter, Cottons, 189.
 Erhard & Sons, Silverware, 190.
 Eriksen, C., Honey, 210.
 Eriksson, G., Stove doors, 212.
 Erlbeck, A., Laces, 195.
 Ernst, F., Wool goods, 199.
 Ertlbauer, F., Pearl buttons, 196.
 Erwin, H., & Co., Paint, 110.
 Esberard, Ceramics, 243.
 Escales & Hatoy, Silk plush, 190.
 Escobar, J. D., Waters, 101.
 Escobar, J. de D., Salt, 245; Wooden dish, 246; Stirrups, 250.
 Escoffier, G. G., Mechanical articles, 220.
 Escrisc, P., oil, 246.
 Eskitstuna Iron Mnf. Co., Swords, 213.
 Espada, A., Pennyroyal, etc., 250.
 Essadok Sidi Mohammed, Brackets, essences, saddlery, 227.
 Essers, M., Cottons, 189.
 Esterbrook Steel Pen Co., 130.
 Estes, E. B., & Son, Smalts, 110.
 Estey, J., & Co., Organs, 264.
 Etcheveherre, G., Embroidery, 249.
 Etchevehere, I., Flowers, 249.
 Etna Furnace, Etna Iron Works, 14; Iron, 21.
 Eureka Manufacturing Co., Air pistols, 128.
 Eureka Mining Co., 44.
 Eurenus & Ivalander, Chemicals, 211.
 Evans, D. S., Needles, 148.
 Evans, F. H., Bolts, 138.
 Evans, H., Wine, 157.
 Evans, W. D., & Co., Razor strops, 136.
 Evans Rifle Manufacturing Co., 132.
 Evans, Sons, & Co., Perfumery, 142; Drugs, 149.
 Evans, Mercer, & Co., Pharmaceutics, 171.
 Evansville Cotton Mnf. Co., 118.
 Everaert, J., & Sisters, Lace, 204.
 Everaert, Leclercq J., Lace, 204.
 Everett Mills, Cottons, 120.
 Everett, B. C., Trusses, 123.
 Everitt, E. E., Furniture, 113.
 Everling, C., & Co., Cottons, 189.
 Ewart, W., & Sons, Linens, 145.
 Ewing & Co., Mirrors, 173.
 Ewitt, W. E., Iron work, 176.
 Excelsior Coal Mining Co., 16.
 Excelsior Flint Glass Co., 113.
 Faas, A., Pianos, 264.
 Faas, A. J., jr., Accordeon, 264.
 Faber, A. W., Pencils, 191.
 Faber, C., Linens, 189.
 Faber, E., Lead pencils, 129.
 Fauchere, A. L., & Co., Mantels, 17.
 Fagersta Stock Co., Ores, 84.
 Fagersta Manufacturing Co., Saws, 214.
 Faglioli, G., Paper boxes, 220.
 Fairbanks, Miss J., Fancy work, 175.
 Fairbank & Hames, Blinds, 174.
 Fairchild, L. W., & Co., Gold pens, 129.
 Faivre, Toys, 185.
 Fall River Bleachery, 119.
 Falck, J. A. H., Peaches, 168.
 Falkenberg, J., Linen, 215.
 Fallon, J. T., Wines, 152.
 Faller, Geo. J., Oils, 108.
 Falerone Working Men's Association, Straw hats, 219.
 Falls Co., Cottons, 119.
 Falstron & Tomgrist, Galvanized iron, 139.
 Fandrem, O. C., Costumes, 215.
 Farcy & Oppenheim, Corsets, 183.
 Faria, J., Artificial teeth, 245.
 Farguhar, E. & C., Limestone, 46.
 Farguhar & Booth, Sandstones, 46.
 Farrar, G. H. & L. E., Clay, 47.
 Farnum, J., & Co., Tickings, 118.
 Farina, Maria, Cologne, 188.
 Farinola, M. P., Olive oil, 217.
 Farrell, Misses L. & T., Fancy work, 175.
 Farrell & Co., Safes, 115.
 Earrington, D. W. C., Battery gun, 132.
 Farrington & Kinsey, Wool, 123.
 Faser, C., Frames and glasses, 116.
 Fasmer & Son, Feldspar, 88.
 Fasoldt, C., Astronomical clock, 262.
 Fauth, C., & Co., Scientific instruments, 262.
 Fauvety & Deville, M., Bricks, 246.
 Fava, C., Bitters, 245.
 Fava, A. N., Carved walnut furniture, 218.
 Favier, A., Flowers, 185.
 Fay, C. J., Felts, 122.
 Faye & Thévenin, Silks, 183.
 Fazio, D., Olive oil, 217.
 Feetham, M., & Co., Stoves, 145.
 Fehr, J., Baby powder, 133.
 Felge, P., 181.
 Felsing, C., Ornaments, 192.
 Felt Factory of Wurtemberg, 190.
 Felton, Rau, & Sibley, Varnishes, 109.
 Fenton, J. H., & Bro., Hats, 126.
 Fenneysey, C. D., Photographs, 168.
 Ferguson Bros., Salteens, 145.
 Fergusson & Co., Straw braid, 233.
 Fenerty, E. L., & Co., Skates, 176.
 Fergusson & Co., Silks, 233; Hemp, 234; Bean cakes, 234.
 Ferguson & Urie, Glass, 153.
 Ferniani, C. A., Crockery, 218.
 Fernlund, E. F., Clothing, 212.
 Ferrari, G., Cabinetware, 113.
 Ferreira, Junior, Canes, 244.
 Ferrell, J. A., Ordnance, 132.
 Ferrer, E., Seed flowers, 249; Medicinal herbs, 250.
 Ferrino, C., Nitrate, 216; Sand paper, 220.
 Ferslen, C., & Co., Registers, 209.
 Fiske Bros. & Co., Umbrellas, 128.
 Fenton, Connor, & Co., Linens, 145.
 Fenton, J., Pearl buttons, 148.
 Fialkowski, Paper, 197.
 Field, A., & Sons, Buttons and eyelets, 128; Tacks, 138.
 Field, Haviland C., Porcelain, 180; China, 181.
 Field, J. C. & J. T., Gloves, 126.
 Field, J. C. & J., Candles, 141.
 Field, J. C., Night lights, 145.
 Fieldskov, V., 208.
 Fierz, H., Shawls, 199; Cotton goods, 199.
 Fifield, J. B. M., Bed sofa, 115.
 Figuerdo & Co., Boots & shoes, 244.
 Filko, Hides, 245.
 Finnegan, J. H., Stone, 18.
 Finnegan, M., Stone, 18.
 Fink, M., Skins, 156.
 Fiolet, L., Pipes, 180; 185.
 Fire Proof Building Co., Bricks, 18.
 Fisch Bros., Embroideries, 200.
 Fishblatt, L., Furs, 129.
 Fischer, A., Wines, 157.
 Fischer, F., Silk hats, 244.
 Fischer, J. G., 191.
 Fischer, J., Meerschaum pipes, 196.
 Fischer, S., China, 193.
 Fisher, W., Tripoli, 47.
 Fischer & Co., Furniture, 242.
 Fisher & Bird, Mantels, 118.
 Fischer & Schmitt, Chemicals, 187.
 Fisse, Thirion, & Co., Iron clasps, 181.
 Fitts, C., & Son, Oils, 153.
 Flutching & Co., Mattresses, 173.
 Fitts, C., & Sons, Glue, 156.
 Flaherty, R., & Co., Safe, 173.
 Flaurand & Son, Laces, 184.
 Fleisher, S. B. & M., Braids, 124.
 Fleishmann, Wm., Pearl buttons, 196.
 Fleitmann & Witte, Nickel, 60.
 Fleming & Talbot, Electrics, 263.
 Fletcher, R., & Son, Papers, 148.
 Flint Mills, Cottons, 120.
 Floreffo Co., Mirrors, 180, 181; Glass, 201.
 Florence Manufacturing Co., Hand mirrors, 116; Brushes, 139.
 Florence Sewing Machine Co., Skates, 136.
 Foering, Geo. W., Sienna, 110.
 Foley, J., Magnetite, 45; Gold pens, 130.

- Follett, O. S., Sugar of lead, 108.
 Fonara, G., & Co., Wire, 94.
 Fondu, J. B., Locks, 204.
 Font, Chambeyron, & Benoit, Velvets, 183.
 Fontaine, J., Windows, 174.
 Fontana Bros., Stones, 94.
 Fontein, R., Tiles, 205.
 Fontes, V. M., Herbs, 250.
 Fontes, V. M. & N. S., Clay, 100.
 Fonteyn Bros., Silks, 203.
 Fonzo, D., Cream of tartar, 216.
 Foote, A. E., Minerals, 13.
 Foote, H., Wines, 163.
 Forach, A., Jewelry, 184.
 Forbes, R. W., Gun, 164; Phornium, 165.
 Ford, O. D., Stone, 18.
 Ford Bros., Hats, 154.
 Ford Works, Paper stock, 148.
 Forehand & Wadsworth, Fire arms, 132.
 Forest City Stone Co., 17.
 Forge & Rolling Mill Joint Stock Co., 74.
 Fornari, A. G. B., Papers, 220.
 Fornasari, R. & F., Cement, 100.
 Forssell, D., & Co., Hats, 212; Furs, 213.
 Fortenbach & Sons, Watch cases, 262.
 Fortin Bros., Felts, 187.
 Forsyth, J., & Sons, Leather, 151.
 Forsyth, R., Monument, 46.
 Forte, E., Filigree work, 219.
 Fortin Bros., Felts, 182.
 Foshick, E., Clay, 47; Bricks, 172.
 Foster, J. A., Artificial limbs, 134.
 Foster, S. A., & Son, Shutters, 174.
 Foster, S. R., & Son, Nails, 177.
 Foster, W. A., Clay, 47; Bricks, 172.
 Forster, W. F., Bridges, 266.
 Foubert, A., Hair dyes, 180.
 Fouchet, sr. & jr., & Hulme, Cloth, 182.
 Fourcault-Frison, A., & Co., Glass, 202.
 Fouet, Mrs., Underwear, 183.
 Fournier, S., Cream of tartar, 178.
 Fournier, Dondel, & Co., Fenders, 187.
 Fow Loong, Porcelain, 132; Furniture, 133.
 Fox, H. C., & Sons, Glassware, 112.
 Fox, H., & Co., Woolens, 122.
 Foye, W. H., Indexes and clips, 130.
 Fay & Harmon, Corsets, 125.
 Francati & Satamaria, Jets, 147; Jewelry, 219.
 France—Statistical Preface, 48.
 Frances Bros., Laces, 184.
 Francis, T., & Co., Nails, 149.
 Francis & Co., Cements, 29.
 Francis, C., Wines, 157.
 Francis & Loutrel, Inks, 110; Stationery, 130.
 Frank & Co., Metal goods, 189.
 Frankfort Aniline Factory, Chemicals, 187.
 Franklin, Mrs. E. P., Stencils, 136.
 Franklin Mfg. Co., Cottons, 120.
 Franz Bros., Silks, 219.
 Fragueiro, J. M., Lead, 45.
 Fraser, J. W., Coal, 45.
 Frauck Bros., Cloth, 203.
 Frank, J., Bronze ware, 197.
 Franke, C., Fixtures, 193.
 Franks, J., Leather articles, 197.
 Franke, Louis, Fringes, 123.
 Frankl, J. G. & L., Wood specimens, 198.
 Fredriksvorn Rope Manuf'y, Cordage, 216.
 Frees, C. A., Artificial limbs, 134.
 Freitas, Teiyeira de, Lime, 97.
 Frey, O., Essences, 243.
 Frèzon, sr., & Leclerc, sr., Cloth, 182.
 Fric, V., Minerals, 66; Imitation precious stones, 195.
 Fricke, Arthur, Perfumes, 111.
 Friedrich, H. O., Spoons, 188.
 Friedrich, O. B., Furniture, 188.
 Friedrichshall Springs, Managers of, 60.
 Friedman & Lauterjing, Razors, 136.
 Fries, Alex., & Bros., Chemicals, 107.
 Frith & Murphy, Salt, 170.
 Fritsch, J., Laces, 195.
 Fritsch, F., Colors, 192; Soap, 192; Perfumery, 193.
 Fritz, C. E., Chronometer, 262.
 Fritz, John, Terra cotta, 111.
 Fritzsche, Schimmel, & Co., Essences, 111.
 Frizzoni, A. F., Silks, 219.
 Froc, R., & Son, Altars, 181.
 Frohlich's Sons, Woolens, 194.
 Frolich & Son, F. H., Ores, 88.
 Fröllich & Son, Caps, 214.
 Fröllich & Son, Paper hangings, 215.
 Fromage, L., & Co., Fabric, 186.
 Fromage, Lucien, & Co., Elastic tissues, 183.
 Froment, Meurice, Goldsmiths' ware, 186.
 Fromherz, J., Inks, 109.
 Frebitch & Son, Silks, 194.
 Frechette, A. B., Pottery, 172.
 Frederikshalds Match Factory, 214.
 Frenis, A., Cutlery, 181.
 Frenay Bros., Hats, 203.
 French, C., Longicorns, 156.
 French & Co., Crapes, 147.
 Frese, A., Kid gloves, 195.
 Frey, Feer, J., & Co., Ribbons, 199.
 Frost, G., & Co., Corsets, 125.
 Fuchs, A., Wines, 157.
 Fuchs, F. A., Agates, 190.
 Fuchs, G. L., & Son, 188.
 Fuckert, G., Guns, 198.
 Fudigar, H., & Co., Bricks, 246.
 Fugisawa, H., Lacquer, 240.
 Fujikawa, J., Cottons, 237.
 Fukihara, S., Enamels, 240.
 Fukuda, B., Flowers, 238.
 Fukui, B., Model, 239.
 Fuller, A., Ales, 157.
 Fuller, R. T., Sash fastener, 177.
 Fulton, C. A., Gypsum, 47.
 Fulton Furnace, Globe Iron Co., 14; Iron, 22.
 Funaki, S., Brushes, 238.
 Furgusson & Co., Peas; dye stuff, 234.
 Furse, Drotty, & Co., Earth, 94.
 Fusnot, C., & Co., Cartridges, 204.
 Fyler, E. W., Bedstead, 114.
 Fyrwald, C. J. M., Trimmings, 212.
 Gabler Bros., Silverware, 190.
 Gabriel, H., & Sons, Bed spreads, 118; Hosiery, 125.
 Gabriel, E., Pearl buttons, 196.
 Gabriel, P. J., Indian implements, 261.
 Gadamer & Jaeger, Matches, 188.
 Gaffrè & Caen, Pens, 185.
 Gage, T., Rockets, 142.
 Gagel, L., Basket goods, 192.
 Guillard, J., sr., & jr., Laces, 184.
 Galarraga, E. G. de, Rock, 99.
 Galbraith, A., Wax flowers, 127.
 Galeano, S., Blinds, 246.
 Gale, D. A. T., Roaster, 117.
 Gale & Co., Tents, 119.
 Galena Oil Works, 109.
 Galinda, C., Copper, 101.
 Galindez, C., Ore, 99.
 Gallais, A., Furniture, 181; Nails, 186.
 Gallas, J., Pasteboard boxes, 196.
 Galli, C., Olive oil, 217.
 Gallia Furnace, Iron ores, 14; Iron, 22.
 Gallway & Graft, Statuary, 111.
 Galvan, F., Coal, 99.
 Galvano-Faradic Manufacturing Co., Electrics, 263.
 Galway Lead Mining Co., 45.
 Galzy, E., Insect products, 179.
 Gamage, A., Piano forte, 265.
 Gambrell, Sons, & Co., Cotton duck, 118.
 Gáraflich, S., Castings, 192.
 Garaldini, E., Jewelry, 219.
 Garan, S., Tamarinds, 220.
 Garber & Son, Linen goods, 194.
 Garceix, Prof., Minerals, 97.
 Gardner & Co., Chairs, 113.
 Gardner, W., Cannon, 132.
 Gardner, J., Lamps, 144.
 Garjeame, A. G., Carpets, 205.
 Garlive, N., Stone, 100.
 Garnier, P., Pharmaceuticals, 179.

Garre, F., Lead, 97.
 Garry Iron Roofing Co., 118.
 Garsed Bros., Awnings, 118.
 Garvies, C. A., Limestone, 46.
 Gascon, L. R., Bolting silk, 183.
 Gashu, S., Awaji faience, 239.
 Gaskell, Deacon, & Co., Alkali, 141.
 Gaskell, J., Snipe, 156.
 Gaskell & Co., Flowers, 158.
 Gastinel Bey, 223.
 Gatling Gold Mining Co., 44.
 Gatling, R. J., Battery gun, 132.
 Gaudichet, Carriages, 187.
 Gauthier, Iron ore, 45.
 Gautier, O., Pig iron, 48.
 Gautier, Bellow, & Co., Velvets, 183.
 Gautz, Geo. F., Baking powder, 107.
 Gauvreau P. & Co., Cements, 46.
 Gaylord Manfg Co., Swords, 133; Locks, 137.
 Gebbie & Barrie, Publishers, 260.
 Gebhard & Co., Satins, 190.
 Geddes, J. W., Skylight, 118.
 Gee, J. N., Mineral waters, 48.
 Geisel & Hartung, Silverware, 190.
 Gelos, M., Minerals, 99; Lime, 100; Sea salt, 245; Spurge, 250.
 Gemrig, J. H., Surgical instruments, 133.
 Gemunder, A., Double bass, 264.
 Gemunder, G., Violins, 264.
 Generois, F., & Sons, Soaps, 217.
 Gentessc, C., Head-dress, 175.
 Genthe, A., Graphite, 66.
 Gennermann Bros., Brushes, 192.
 Gentile, G., Cream of tartar, 216.
 Gentiluomi, G. V., & Co., Col. cot. gds., 218.
 Georgi, G. A., Piano fortes, 264.
 Geological Society of Sweden, 84.
 Geological Survey of So. Norway, 88.
 Geological Survey, New Zealand, 164.
 Geological Survey, Canada, Salt, 171.
 Gerber & Co., Milk, 201.
 Germania Mills, Woolens, 122.
 Gerosa, A. E., Embroidery, 219.
 Gerrard, A. W., Pharm., 141; Plasters, 149.
 Gerwig, A., 191.
 Ges, Pareira de, Minerals, 97.
 Gest & Atkinson, Oils, 108.
 Gesswein & Reichhelm, Tools, 136.
 Gettysburg Katalysine Co., Spring water, 19.
 Gwelot, Ammunition, 180.
 Gévelot, Guns, 185.
 Gevers & Schmidt's Carpet Factory, 190.
 Ghibellini Bros., Varnish, 217.
 Ghys, B., Lace, 204.
 Giacomazzi, F. S., Sea salt, 216.
 Giacomazzi, R. F., Licorice, 216.
 Giacomini, Luigi, & Co., Brushes, 220.
 Giannotti, G., Silks, 219.
 Gianoli Bros., Soaps, 217.
 Gibb & Co., Carpet, 123.
 Gibbon, J. M., Cochineal, 168.
 Gibbs & Coursolle, Parchment, 175.
 Gibbs, G. & Co., Bolts, 177.
 Gibson, R. L., Sandstones, 46.
 Gibson & Tyler, Blankets, 123.
 Gibson, W., Watches, 147.
 Gien Pottery Manufacturing Co., 181.
 Gifford, S., Ore, 99.
 Gigena, J., Horse cloth, 250.
 Gihlmann, Joseph, Molds, 18.
 Gilbert, G. H., Flannels, 123.
 Gilbert, A. A., Medicines, 133.
 Gilbert, A. N., Wools, 158.
 Gilbert, J., Wines, 162.
 Gilkinet, C. J., Ink, 201.
 Gill, Wm. F., Books, 261.
 Gillard, J., Wines, 163.
 Gillet & Son, Chemicals, 180.
 Gillett & Son, Silks, 183.
 Gillon, S., Lace, 204.
 Gilman, J. H., Lava, 242; Bamboo, 242.
 Gilmour, A., Oats, 156.
 Gilmour, J., Hams, 165.
 Gilmour, G., Augers, 176.

Gilpin, E., Sandstones, 46; Bricks, 173.
 Gilpin & Brunier, Chemicals, 109.
 Gilroy & Hurst, Baking powders, 150.
 Gimenez, L., Writing desk, 246.
 Gimenez, Jose, Silk sash, 249.
 Ginskey, I., Carpets, 194.
 Giordano, S., Contract, 220.
 Gioiuzza, G., Jewelry, 219.
 Giraudat, A., Flower materials, 127.
 Giraud, A., & Co., Silks, 183.
 Girondeau, F., Bronzes, 185.
 Giro, Heitaka, 236.
 Girou Bros., Ribbons, 183.
 Girard, C., Cutlery, 186.
 Giraud & Josserand, Muslins, 184.
 Giulivo, B., & Co., Knives, 220.
 Gladbach Stock Spinning Mills, 189.
 Gladwin, J. P., Ornaments, 167.
 Glasgow Co., Gingham, 120.
 Glassware & Plate Glass Manufacturing Co., 202.
 Glass Works Joint Stock Co., 202.
 Glazier, J. J., Bro., & Co., Hosiery, 124.
 Gleason, W. B., & Co., Decorations, 116.
 Gledhill, Bottles, 153.
 Glendale Elastic Fabric Co., 139.
 Glendenning & Truitt, Whips, 127.
 Glendon Iron Co., 15, 20.
 Glenister, W. A., Axles, 154.
 Glenn, F., Buffet, 115.
 Glesias, J., Soap, 246.
 Glessner & Gilbert, Paper, 130.
 Globe Furnace Co., Iron ores, 14.
 Globe Rolling Mill Co., Iron, 21.
 Globe Iron Co., 22.
 Globe Woolen Co., 121.
 Globe Nail Co., 137.
 Gölmsta Factory, Furniture, 212.
 Glorud Nickel Co., 88.
 Gloucester Gingham Mills, 120.
 Gnocchi, G., Inks, 217.
 Gödecke, C., Furnaces, 60.
 Godfredsen, R., Belting, 210.
 Godfrey, Bro., & White, Gypsum, 19.
 Godfrey, C. J., & Son, Thimbles, 129.
 Godfrey, F. R., Animals, 156.
 Gocbel, J., Clay, 112.
 Goedwaagen, P., Stoves, 205.
 Goertz & Kirch, Cottons, 189.
 Goff, R. W. P., Cabinet ware, 116.
 Goff, D., & Son, Braids, 124.
 Goggin, J., Jewelry, 127, 147.
 Gogby, A., Artificial flowers, 185.
 Goldecke & Co., 188.
 Golden Stream Claim, Quartz, 161.
 Goldwark, J., Percussion caps, 132.
 Göldy, A., & Co., Embroideries, 200.
 Goldsmith, J. G., Piano fortes, 264.
 Goldschmidt, H., Razor strops, 136.
 Goldschmidt's Sons, M., Ornaments, 195.
 Goldsmiths' Stock Co., Tankard, 212.
 Goldsborough, J., Hand stamps, 129.
 Goldsbrough, R., & Co., Wools, 158.
 Goncalves, J., Kaolin, 97.
 Gondard, Cirlot, & Martel, Velvets, 183.
 Gong Bell Manufacturing Co., 138.
 Gonthier, Dreyfus, & Co., Stationery, 185.
 Gonzalez, D., Flower wreath, 249.
 Gonzales, J., Medicinal herbs and plants, 250.
 Goodall, C., & Son, Cards, 148.
 Goodall, Blackhouse, & Co., Food, 149.
 Goodier, J., Trusses, 133.
 Goodwin, A. J., Bedstead, 115.
 Goodfellow, J., Sandstones, 46.
 Goossens & Voets, Soaps, 201.
 Gore Paper Mills, 175.
 Gordon, W. J. M., Chemicals, 107.
 Gordon, A. D., Felts, 131.
 Gorham Manufacturing Co., Silverware, 116.
 Gori, M. W. C., Conveyances, 206.
 Gortor, D. & S., Soap, 205.
 Gosse, Perier, Artificial flowers, 185.
 Gossieux, F., Picture, 204.
 Gossin, F., Terra cotta, 111.

- Göteborgs Mechanical Works Stock Co., 85.
 Goto, T., Paper, 239.
 Gottschalk, I. C., Essences, 210.
 Goudie, T., Cement, 46.
 Goudle, T., Limestone, 46.
 Gough, Edward, Turned rolls, 21.
 Gould's, M., Sons, Stair rods, 137.
 Gourd, Croizat, Son. & Dubost, Silks, 183.
 Govaert Bros., Canvas, 203.
 Governor & Company of Copper Miners, 30.
 Government Survey Department of Map, 242.
 Government Printing Office, Sidney, Blank books, 151; Orchids, 152.
 Government Arms Manufactory, Denmark, 206.
 Goyard, F., Crucibles, 180.
 Goyaz, Province of, Minerals, 97; Brooms, 245.
 Goyers, J. A. & H., Pulpit, 202.
 Graham, A. J., Phonographic works, 260.
 Graham, T., Wool, 163.
 Gramignani, L., Dental prothesis, 220.
 Gram, W., Buffet, 215.
 Gramm, W., Ornaments, 215.
 Grand Tower Mining Co., Ores, 15, 21.
 Grand Trunk R. R., Peat, 45.
 Grand Rapids Brush Co., 139.
 Granholm, J. P., Amykos, 211.
 Granite Mills, Cottons, 120.
 Grant Furnace, Iron ores, 14; Iron, 21.
 Grant, G. H., Settees, 115.
 Grant & Co., Rifles, 133.
 Grant, Mrs., Tomato sauce, 157.
 Grant & Co., Cordage, 164.
 Grant, C., Chemicals, 170; Beeswax, 170.
 Grassi, F., Letter press, 219.
 Grasso, G., Juice of licorice, 216.
 Grattarola, C., Picture frames, 213.
 Grau, C., Fans, 196.
 Graves, V., Paper, 176.
 Gravier, C., Carpets, 182.
 Gray's Chalk Quarries, 29.
 Gray, Young, & Spalding, Brine, 48; Salt, 171.
 Gray & Scott, Salt, 171.
 Gray, H. D., Sulphur, 108.
 Gray, A., & Co., Tweeds, 154.
 Grayling, W. S., Extracts, 163; Hinaiu bark, 164.
 Gray, H., Buggies, 178.
 Great North of Scotland Granite Co., 29.
 Great Falls Manufacturing Co., Sheetings, 118; Cottons, 119, 120.
 Greenbank Alkali Co., 141.
 Greener, J., Coal, 45.
 Greener, W. W., Guns, 148.
 Greenfield & Stewart, Door, 163.
 Greening, N., & Sons, Woven wire, 145.
 Green & Daniels, Spool cotton, 119.
 Greenweed Pottery Co., 112.
 Green, S. H., & Sons, Prints, 121.
 Green, J., & Nephew, Cutlass, 144.
 Green, E. C., Guns, 149.
 Green, R., Cradles, 151.
 Green, J. K., Wines, 168.
 Green, T., 208.
 Greenmount Spinning Co., 145.
 Greer & Co., Wines, 157.
 Greeves, E. G., Wool, 158.
 Gregory & Co., Steel, 20.
 Gregory, V. R., & Co., Monument, 47.
 Gregory, J., Fire escapes, 144.
 Gregory & Co., Carpets, 146.
 Greiffenhagen, W., Wines, 157.
 Greiner, E., Nephew's Son, Colors, 188.
 Gressard & Co., Silks, 290.
 Grest & Co., Trunk, 249.
 Grewar, J. W., Wool, 168.
 Griendling, J., Chairs, 114.
 Griffin, R. A., Peat, 45.
 Griffiths, J. W., Books, 260.
 Griffiths, W. K., Quartz, 161.
 Griffith & Co., Latches and locks, 177.
 Grillo, Ceramics, 243.
 Grillon, E., Indian dates, 179.
 Grind, G. R., Brooms, 177.
 Grison, T., & Co., Cloths, 182.
 Grimaldi, G., Extract of Licorice, 216.
 Grimm, B., Coins, 234.
 Grohman & Kessler, Glass articles, 123.
 Grolman, C. W., Frames, 205.
 Grootes, M., Blueing, 25.
 Gropengeisser, J. L., Clock, 162.
 Gros & Co., Corset, 100.
 Grosse, F., Wines, 157.
 Groton Manufacturing Co., Cottons, 120.
 Grote, F., & Co., Ivory goods, 129.
 Grottenthaler, V., Blocks and pipes, 128.
 Grove Hill Co., Quartz, 161.
 Groveland Mills, Flannels, 123.
 Grude, F., Felt hats, 190.
 Grunhut, L., Leather gloves, 195.
 Grunwald & Kiel, Cottons, 189.
 Grunwood, T., Game, 156.
 Grycksbo Factory, Paper, 213.
 Guemes, D., Lignum vitæ cup, 246.
 Guerth, J., Reeds, 244.
 Guerard, E. von, Painting, 154.
 Guerin, C., Carriage, 178.
 Guest, T. B., & Co., Biscuits, 157.
 Guglielmini, A., Olive oil, 216.
 Guibert, jr., Gloves, 184.
 Guiffida, L. G., Oil of sweet almonds, 217.
 Guillaumet, A., & Sons, Woolen fabrics, 182.
 Guille Anti-Friction Metal Co., 20.
 Guillemin, R., Cutlery, 186.
 Guillery, H., Wound dressings, 204.
 Guimaraes, M. A., Flowers, 244.
 Guimaraes, F., Saddles, 245.
 Guimaraes, A., Saddles, 245.
 Guimaraes, Varnish, 243.
 Guinet, Ultramarine, 180.
 Guinet, A., & Co., Silks, 183.
 Guinon's Son, & Co., Chemicals, 180.
 Guérin, R., Widow, & Son, Merinoes, 182.
 Gulden, H., Gloves, 190.
 Guldberg, C. H., Varnish, 209.
 Gullbergs, T., Stock Co., Acid, 211.
 Gundlach Bros., Clay goods, 188.
 Gundlach, W., & Son, Clay goods, 183.
 Gundlach, J., jr., Clay goods, 188.
 Gunning, T. B., Cleft palate appliances, 134.
 Gunn, J. H., Quartz, 161.
 Guntsche & Shroeder, Trunks, 249; Saddles, 250.
 Gurley, W. & L. E., Surveyors' instruments, 261.
 Gurney, H. D., Granite, 17.
 Gustafsbergs Mnfg. Co., Pottery, 211; China, 212.
 Gustafson, G., Knives, 214.
 Guthrie, E. D., Pottery, 153.
 Guth, Henry, Glass instruments, 112.
 Guttee, L., Carving, 188.
 Gujer-Brunner, Bed covers, 199.
 Guyot & Migneaux, Artificial birds, 185.
 Guyot-Lupold, A., Chemicals, 199.
 Gugaux Bros., Marble, 202.
 Gysae, R., Chemicals, 187.
 Gyserige Iron Works, 84, 85.
 Haarmann, W., 188.
 Haas, J. A., & Co., Jewelry, 127.
 Haberkorn, G., Leather gloves, 195.
 Hache & Pepin, China, 181.
 Hack & Co., Peat bricks, 60.
 Hackfeld & Co., Coffee, 243.
 Hada, D., Bronzes, 238.
 Hadley & Co., Cotton yarns, 119.
 Haenle, L., Paper hangings, 191.
 Haffner, B., sr., Safes, 181.
 Haensel, H., 188.
 Hagelhuirst & Co., Iron works, 176.
 Hagner Drug Milling Co., 108.
 Hagstoz & Thorpe, Watch cases, 262.
 Hahl, A., & Co., Electrics, 262.
 Hahn, G., 191.
 Hahn, P., Agates, 190.
 Hahn, C., Agates, 190.
 Hainaut Glass Manufacturing Joint Stock Co., 202.
 Haines Bros., Piano forte, 265.

- Hake, V., Mrs., Ladies' underwear, 100.
 Halderman, L., & Son, Stone, 18.
 Hale, Kilburn, & Co., Furniture, 115.
 Hale & Co., Furniture, 115.
 Hale & Parshall, Essential oils, 111.
 Hale, B. S., & Co., Fish lines, 119.
 Hale, A. W., Gas tube, 117.
 Halkier, P. A., Timber, 210.
 Hall, O. B., & Co., Annunciators, 263.
 Hall, A., & Sons, Bricks, 112; Ochres, 172.
 Hall, G. B., Washing machines, 174; Tubs, 177.
 Hall & Son, Chimney brick, 111.
 Hall, J., Wool, 165.
 Hall & Garrison, Mirrors, 116.
 Hall, Elton, & Co., Plated ware, 116.
 Hall, T., Decorations, 146.
 Halland & Co., China, 181.
 Hale, B. S., & Co., Electric wire, 264.
 Hallet, Davis, & Co., Pianos, 264.
 Halling, A., Knives, 214.
 Hall's Safe & Lock Co., 115, 137.
 Halon, A., Marble, 46.
 Hambleton, J., & Son, Colognes, 111; Porcelain, 112.
 Hamblet, J., Bricks, 142.
 Hamden Furnace, Iron ores, 14; Iron, 22.
 Hamerli, J., Leather gloves, 195; Trusses, 198.
 Hamelin, A., Son, Silks, 183.
 Hamilton Woolen Co., Prints, 121, 123.
 Hamilton & Hunt, Plated jewelry, 127.
 Hamilton & Booth, Silk, 123.
 Hamilton, Homer, Stone, 18.
 Hamilton Powder Co., 172.
 Hamil, W. J., Carriages, 177.
 Hamilton Mfg. Co., Cottons, 120.
 Hammer, W., 208.
 Hammond, J. L., 232.
 Hampton, Cutter, & Sons, Clays, 18.
 Hampton, C. F., Augers, 135.
 Hampton Nor. and Agricultural Ins., Views, 257.
 Hance Bros. & White, Fluid extracts, 107; Drug mill, 133.
 Hancock, H. R., Machine, 162.
 Hand, James C., & Co., Corundum, 19.
 Handy & Boland, Surgical appliances, 134.
 Hanford, Theo., Gold specimens, 23.
 Hanging Rock Iron Furnaces, 16, 20.
 Hanging Rock Iron Reg., 14, 22; Map, 266.
 Hanhart-Solivo, J., Cambrics, 199.
 Hanke, R., Pitchers, 188.
 Hanssen, F., Oil, 214.
 Hansen, C. B., Furniture, 209.
 Hansen, C., Extract, 208, 209.
 Hansen, J., 208.
 Hansen, O., 208.
 Hapke, A. B., Embroideries, 124.
 Happel & Bro., Parlor suit, 244.
 Harboe, C., Minerals, 209.
 Hardy, T., Raisins, 162.
 Hardy, A., Cork, 162.
 Hardie, J., Biscuits, 152.
 Harder, J., & Sons, Guns, 133.
 Hardman, H., Piano fortes, 265.
 Hardy, Milori, C. G., Colors, 180.
 Hargs Manufacturing Co., Yarns, 212.
 Hargreave & Nusseys, Woolens, 146.
 Harkness, N. W., Oils, 109.
 Harkness, A., & Co., Cam, 155.
 Harling, Mrs., Ferns, 151.
 Harleigh Coal Co., 16.
 Harman, G., Petrification, 232.
 Harnisch, G., Wheels, 198.
 Harper & Moores, Fire clays, 143.
 Harrigan, I. J., & Son, Axes, 176.
 Harris, J., & Co., Iron, 48.
 Harris, S., & Sons, Combs, 128.
 Harrison Bros. & Co., Chemicals, 107, 109.
 Harrison & Evans, Salt, 171.
 Harris, J., & Co., Ship camboose, 173.
 Harrison, George K., Clays, 29.
 Harris, James, & Co., Iron work, 177.
 Harris Manufacturing Co., Shirtings, 120.
 Harrington & Richardson, Firearms, 133.
 Harrison, W. H., & Bros., Grates, 137.
 Harrington, J., & Co., Leather work, 148.
 Harrison & Kellogg, Wrenches, 136.
 Hartshorn, S., Shade rollers, 115.
 Hartmann, L., & Eidam, Turners' articles, 196.
 Hartel, Andreas, & Co., Prints, 121.
 Hart, J., 232.
 Hart, C. A., Gold fringes, 113.
 Hartford Carpet Co., 123.
 Hartman, M. P., Glass, 193.
 Hartman, Laist, & Co., Glycerin, 109.
 Hart, A. H., & Co., Carpet warps, 119; Twines, 139; Tools, 136.
 Hart, Son, Peard, & Co., Metal work, 144.
 Hart, C. A., Banners, 139.
 Hart, Bliven, & Mead Mfg. Co., Gongbells, 130; Tools, 136.
 Harvey & Baird, Shirts, 125.
 Harvey & Ford, Canes, 128.
 Harvey & Adamson, Drain pipe, 111.
 Hasslauer, Mrs., & Champaux de, Pipes, 185.
 Hassebroucy Bros., Threads, 182.
 Hasslauer & de Champeaux, Pipes, 180.
 Hastings & Peterkin, Turned wood, 174.
 Hastings & Co., Gold leaf, 19.
 Hastings, Cunningham, & Co., Wool, 158.
 Hatch, John, Minerals, 13.
 Hattersley, J., Aerated waters, 36.
 Hauckar, J. H. H., Nickel ore, 36.
 Hauer, C., Leather gloves, 195.
 Hauf, Dr., Brandy, 169.
 Haus, O., & Co., Glass, 202.
 Hausen, R., Tachygraph, 210.
 Hauber, G., Silverware, 190.
 Häusler, C. S., Cement, 60.
 Hausman, W., Rope articles, 198.
 Haverhill Hat Co., 126.
 Haviland & Co., China, 180.
 Hawaiian Museum, Specimens, 242.
 Hawaii Department of War, 242.
 Hawell, J., Pearl buttons, 196.
 Hawkes, G. F., Gold pens, 129.
 Hawkins, J., & Sons, Prints, 145.
 Hawkins Bros., Saddlery, 150.
 Hawksworth, Ellison, & Co., Steel, 149.
 Hawsky, A., Lanterns, 191.
 Hawzeur, G., Son, Thread, 203.
 Haycock, W., Magnetite, 44.
 Haycock, E., Iron, 48.
 Hayden, J., Shirts, 126.
 Hayden, J., H., & Son, Sewing silk, 124.
 Hayes, Coulter, & Co., Mantels, 17.
 Hayes, Crossley, & Co., Needles, 148.
 Haymann Bros., Papers, 185.
 Hayslip, J., Limestone, 46.
 Hays, D., Gloves, 46.
 Hays, Miss A., Painting, 168.
 Hayward, Armstrong, & Co., Wool, 163.
 Hazard Powder Co., 111.
 Hazleton Bros., Pianos, 264.
 Health Lift Co., 266.
 Heap, G. H., 227.
 Heard & Sons, Architects, 267.
 Heathcote, T. S., Panels, 155.
 Heath, W., Needles, 148.
 Heaps & Wheatley, Stoves, 144.
 Hechelman, H. W., Ear and eye preparations, 133.
 Hccla Iron and Mining Co., 14, 21.
 Hedengren & Son, Store sets, 212.
 Hedlun, J., Locks, 214.
 Hedlund, J., Metal work, 212.
 Heering, Peter F., Cordial, 210.
 Heppermehl, L., Carriages, 216.
 Hegle, Glandines, & Corbeau, Gloves, 184.
 Hegle, F., Gloves, 126.
 Heidegger, W., & Co., Metal ware, 191.
 Heidegger, Wegmann, & Co., Bolting cloth, 199.
 Heike, A., Buttons, 169.
 Heiligmann & Bro., Carvings, 113.
 Heilbronn, L., Glass, 188.

- Heinitz & Seckelson, Paper, 191.
 Heindenrych, B. G. P., Starch, 169.
 Heinisch's, R., Sons, Shears, 137.
 Heir, S. S., Silks, 219.
 Heiss, F., Turners' articles, 196.
 Heister & Gans, Umbrellas, 128.
 Heljestrand, C., Razors, 214.
 Hellendall & Steinberg, Cottons, 169.
 Heller & Brightly, Astronomical Instruments, 261.
 Heller's Sons, Buttons, 196.
 Heller & Merz, Ultramarine, 109.
 Hellnich, F. A. E., Buttons, 196.
 Helmbrecht, G., 191.
 Helsingborgs Pottery Mnf. Co.
 Hémer, E., Jewelry, 184.
 Heminway, M., & Sons Silk Co., 124.
 Hemmings, F. W., Cocoanut, 151.
 Hemmings, F. & W., Cotton, 152.
 Hemlin, G. U., & Co., Clothing, 212.
 Hemrichshutte, Metals, 60.
 Hems, H., Alabaster statue, 144.
 Henderson & Farrah, Ales, 165.
 Henderson, James, Iron, 20.
 Henderson & Co., Carpets, 146.
 Hannecart & Co., Papers, 185.
 Henelly, J., Ale, 157.
 Henkels, Geo. J., Furniture, 113.
 Henkels, J. A., Furniture, 114.
 Henly, D., Artificial flowers, 123.
 Henninger, Soaps, 243.
 Henny, C. O., Glue, 205.
 Henry, D. F., Tunnel, 263.
 Henry, J. A., Silk fabrics, 183.
 Henroz, C., Stone, 201.
 Henry, J., Ferns, 164.
 Henrion, J. J., Cloth, 203.
 Henriksen, H., Sewing machine, 210.
 Henry, A., Firearms, 148.
 Henty, E., Wools, 153.
 Heppe, C. J., Pianos and organs, 264.
 Hepworth, B., & Sons, Wrappers, 146.
 Herbert, F. P., Ceruse, 192.
 Herbelot & Devaux, Laces, 184.
 Herder, L., Shears, 136.
 Hermant, F., Ambulances, 204.
 Herman, J. L., Wire goods, 189.
 Hermann, L., Perfumery, 180.
 Herminghaus & Co., Clothes, 189.
 Hermann, W., Paintings, 168.
 Hermansson, Count, Ores, 84.
 Herrera, N., Slate, 100.
 Herring & Co., Safes, 115; Bank locks, 138.
 Herreborg, O., Fruits, 210.
 Herrera, M., Seeds, 246.
 Herring, R., Plans of bridges, 266.
 Herr, Jos. C., Iron ores, 13.
 Herringer, J., Agates, 190.
 Hertel, C., & Son, Silverware, 190.
 Herting, C., Paper hangings, 191.
 Herth, H., Boots, 183.
 Herts & Co., Furniture, 113.
 Herve, F., Cloth, 203.
 Hess, M., 191.
 Hess Bros., Shirts, 200.
 Hesse, G. W., Vases, 209.
 Hesselbein, S., Embroideries, 190.
 Hassenbruch, T., & Co., Shears, 136; Steel 192.
 Hetley, J., & Co., Glass shades, 143.
 Hetzer & Sons, Silk ribbon, 194.
 Heuse, E., Gun barrels, 204.
 Heussim, Sidi, 227.
 Heustis, R. B., Sandstones, 46.
 Hewitt, W., Swing carriage, 117.
 Hewitt, T. G., Tallow, 152.
 Hews, A. H., Earthenware, 111.
 Heydt, F., Agates, 190.
 Heyl, J. F., & Co., Chemicals, 187.
 Heyman & Alexander, Laces, 147.
 Heyman, P. W., Butter, 210.
 Heywood Bros., & Co., Chairs, 115.
 Hibbard, F., Antimony, 45.
 Hickisson, Mrs. M. A., Ink, 142.
 Hickman, J. S., Saline waters, 48.
 Hicks, J. J., Instruments, 149.
 Hicks, G. C., & Co., Terra cotta, 112.
 Hickory Coal Co., 16.
 Hideham, Kawai, 236.
 Hielard, L., & Co., Feathers, 185.
 Hieronimus, W., Mouldings, 144.
 Hiester, C. E., Exercising clubs, 266.
 Higgin, T., & Co., Salt, 141.
 Hilditch, G. & J. B., Silks, 147.
 Hildreth, M., & Co., Jewelry & combs, 126.
 Hildebrand & Wolf, Locks, 137.
 Hiler, S., Door knobs, 138.
 Hill, A. J., Sellenite, 47.
 Hill, E. P., Table, 115.
 Hill, J. W., Clock, 262.
 Hill Manufacturing Co., Cottons, 118.
 Hill, A., & Sons, Paper, 131.
 Hiller, O., Roofing, 60.
 Hilman, Wm., Carriage trimmings, 177.
 Hilversumsche Spinning & Weaving Manu-
 factory, 205.
 Hime, L. H., Pyrites, 45.
 Hinckle & Mayon, Surgical appliances, 134.
 Hincks, Wells, & Co., Steel pens, 148.
 Hinderager Mining Co., Ores, 88.
 Hinds & Sons, Piano fortes, 264.
 Hinger, H., Linen cloth, 174; Blankets, 174.
 Hinrichsen, W., 191.
 Hinsdale Bros., Woolens, 122.
 Hinvest, Robt., Chimney tops, 111.
 Hippisley, A., Screens, 234.
 Hirschberg, M., & Co., Embroideries, 190.
 Hirschfeld Bros. & Co., Lace curtains, 200.
 Hiromichi, Rubo, 236.
 Hirn, A., & Co., Jewelry, 184.
 Hirsch & Bro., Umbrellas, 127.
 Hirsch & Merzenich, Chemicals, 187.
 Hirushi, Shibata, 236.
 Hisgen, G. C., Chemicals, 187.
 Hitchcock, H. R., Specimens, 242.
 Hitchcock, D. H. & E. G., Ferns, 243.
 Hitchcock Lamp Co., Lamps, 117.
 Hitchcock, Williams, & Co., Costumes, 147.
 Hlawatsch & Isbary, Shawls, 194.
 Ho A. Ching, Fans, 233; Ivory, 234; Lacquer
 ware, 234.
 Hochstatter, H., Matches, 188.
 Hockstetter, B., Flowers, 191.
 Hockanum Co., Woolens, 122.
 Hodges, T. W., & Sons, Braids, 147.
 Hodgson Bros., Blinds, 153.
 Hodgson, G., Timber, 151.
 Hodgson, R., Metals, 36.
 Hoe, R., & Sons, Leather work, 148.
 Hoel, P. C., Oil, 214.
 Hoentle, L., 188.
 Hoffman, A. O., Stone, 18.
 Hoffman, J., Leather gloves, 195.
 Hoff, C., Cotton, 152; Preserves, 152.
 Hoff, M. C., Indigo, 150; Coffee, 151.
 Hofors & Hammarby, Ores, 84.
 Hofrichter's Son, J., Imitation gems and
 papier-mache boxes, 196.
 Höganäs Coal Mining Co., 211.
 Höganäs Stenkolsverks Bolag, Tiles, 211.
 Höganäs Coal Works, 84.
 Hogg, S. P., Curry powder, 153.
 Ho Kan-Cheu, Old china, 232; Old bronzes,
 233; Silks, 233.
 Holbrook, J. D., Wines, 163.
 Holiwell, W. A., Door pulley, 177.
 Holland, J., Toothpicks, 128.
 Holland, B. H., Timber, 168.
 Holland Manufacturing Co., Sewing silk, 124.
 Hollick & Co., Cement, 29.
 Holley, Alex. L., Mining exhibit, 23.
 Holland, James M., Gold ores, etc., 13.
 Höller, J. S., & Co., Steel, 192.
 Holand, W. T., Ceramics, 143.
 Holley Manufacturing Co., Cutlery, 136.
 Holland, J., Gold pens, 130.
 Holman, A. J., & Co., Bibles, 260.
 Holmes Burglar Alarm Telegraph Co., 263.

- Holmes, J., Boots, 175.
 Holmen, E., Linen, 215.
 Holmen's Technical Works, Ink, 214.
 Holmblad, L. P., Cards, 209; Candles, 209.
 Holmberg, E., Matches, 211.
 Holmes, Booth, & Haydens, Brass, 23; Plated goods, 116.
 Holmblad, J., 208.
 Holst, C., Chairs, 215.
 Holstein, H., Cotton, 243.
 Holt, R., Towels, 120.
 Howell, W. A., Reim, 178.
 Holyoke Paper Co., 130.
 Holzer, W., Glassware, 112.
 Homberger Bros., Bolting cloth, 199.
 Homer, Colladay, & Co., Ladies' dresses, 126.
 Honeyman, Dr., Fossils, 45.
 Honolulu Iron Works, Photograph of works, 243.
 Hood, A. W., & Son, Soaps, 172.
 Hood & Co., Chemicals, 153.
 Hood, F. & J., Malt, 156.
 Hook, E. & G. G., Organs, 265.
 Hooper & Dodoon, Hops, 164.
 Hooper, W. E., & Sons, Awning stripes, 119.
 Hooper, C., & Co., Woolens, 146.
 Hooper, W. E., Rope, 139.
 Hoorickx, G., Chests, 204.
 Hope Furnace, Iron ores, 14; Iron, 22.
 Hope Company, Shirting, 118.
 Hopper, C. C., Furniture, 115.
 Hopewell Quarry Co., 46.
 Hopkins, W. T., Corsets, 125.
 Hopkins & Robinson Mfg. Co., Pipes, 127.
 Hopkins, C., Tools, 146.
 Hopper, J. A., Calabashes, 242.
 Horfors & Hammarby, Iron, 85.
 Horn, W. H., & Bro., Trusses, 133.
 Horn, J., Buttons, 196.
 Hornbostel & Co., Silk goods, 194.
 Hornabrook, C. A., Wines, 162.
 Horner, A., Lace, 195.
 Horstmann, W. H., & Sons, Yarns, 121; Trimmings, 124; Military goods, 125.
 Horsey, R. M., Metal work, 174.
 Horson, W., Pottery, 172.
 Horter, J., Soap, 163.
 Hoskins, W. H., Stationery, 129.
 Hosada, J., Silks, 238.
 Hotchkiss, H. G., Essential oils, 110.
 Hotchkiss's Sons, Hardware, 136.
 Hotham, Council of, Photographs, 155.
 Hottot, A. & Co., Pepsin, 179.
 Houghton, H. O., & Co., Lithographs, 261.
 Houghton, William D., Wire, 29.
 Houghton, E. F., & Co., Oils, 109.
 Houghton, H. O., & Co., Bookbinding, 131.
 Houpin, E., Cashmeres, 182.
 Houry, T., Paris, Furniture, 181.
 House & Davidson, Doors, 118.
 Hover, H. F., Furniture, 114.
 Hover, J. E., & Co., Inks, 109.
 Hovey, F. S., Sewing silks, 124.
 Hooijen, L. J., Furniture, 205.
 How, H., Minerals, 45.
 Howard & Co., Clocks, 252.
 Howard, R., & Son, Yarns, 121.
 Howard Furnace, Iron ores, 14; Iron, 21.
 Howard, J., Cocoons, 158.
 Howell Bros., Paper hangings, 132.
 Howell & Bourke, Paper hangings, 132.
 Howley, J., Sandstones, 46.
 Howry, J., China, 180.
 Hoyem, A., Ores, 88.
 Hoyer, J., Plates of crystal, 193.
 Hoyt, E. W., & Co., Colognes, 111.
 Hoyt, J., Coal, 45.
 Huard, L., Boots, 184.
 Huber, A., Mirror, 173.
 Huber, E., & Co., Silk plush, 183.
 Hubner, B., Chemicals, 187.
 Huckel's Sons, Hatters' articles, 190.
 Hudon Cotton Mills, 174.
 Hudson Bay Co., Furs, 175.
 Hudson Bros., Joinery, 150; Timber, 151.
 Hudson, J., Coal, 45.
 Hue & Co., Crystals, 180.
 Huffer, H., Worsteds, 189.
 Huffman, William, Stone, 18.
 Huggenberger, U., Hosiery, 200.
 Hughes, T., & Co., Hosiery, 125.
 Hu Kwang-Yung, Silks, 233.
 Hu Kwang Hang Chow, Old china, 232.
 Hu Kwang-Yung, Old bronzes, 233.
 Humbert, H., Hats, 147.
 Humbert & Heylandt, 191.
 Hummel, A., Musical clock, 262.
 Hunnewell Furnace, Iron ores, 14; Iron, 22.
 Hunt, Cairns, & Co., Wheels, 178.
 Hunt, A. M., & Co., Baking powders, 150.
 Hunt, W., & Co., Razor strops, 136.
 Hunter, Rose, & Co., Books, 176.
 Hunter, James, Monument, 29.
 Huret, N., Carriage, 187.
 Hurley, T., Granites, 100.
 Hurlbut Paper Co., 130.
 Hurley, T., Herbs, 250.
 Huron Iron Co., 22.
 Huron Furnace, Iron ores, 14.
 Hurst, I. R., Stone, 18.
 Husquarna Arms Mfg. Co., 213.
 Hussey, Wells, & Co., Steel, 19.
 Hussey & Howe, Mining Co., Ores, 13.
 Hussey, C. G., & Co., Copper sheet, 137.
 Hutchins, G., Jewelry, 175.
 Hutchinson, J., & Co., Soda, 141.
 Hutchinson, J. C., Gloves, 126.
 Hutinet, D., Cards, 185.
 Hvcisel, G., Maps, 209.
 Hyatt & Co., Polishing powder, 19.
 Hyde Mfg. Co., Oil cloths, 121.
 Hygienic Products Mfg. Co., 179.
 Hynek, I., Buttons, 196.
 Hynn, H. L., Copper pyrites, 44.
 Iakob, Adolf, Woolens, 194.
 Ichui, Omori, 236.
 Ida, G. Nagoya, Porcelain, 237.
 Ide, G., Dolls, 238.
 Idiers, E., Cottons, 203.
 Idzukura, K., Silk braid, 238.
 Iida, G., Set of porcelain, 239.
 Iklé Bros., Embroideries, 200.
 Illanes, M. J., Minerals, 99.
 Illinois, State of, Instruction, 258.
 Imai, K., Ivory work, 238.
 Imhauser & Co., Time detector, 262.
 Imperial Flumineuse Agricultural Institute, Hats, 244.
 Imperial Maritime Customs, Cotton, 234; Furs and skins, 233; Ivory, 234; Musical instruments, 234; Wearing apparel, 233; Silk goods, 233; Silk, 233; Seeds, 232; Silver leaf, 232; Felt rugs, 233; Furniture, 233; Timber, 234; Tea kettles, 233; Porcelain, 233; Paintings, 234; Porcelain, 232; Old bronzes, 234; Old china, 233; Grass cloth, 233; Bricks, 232; Reeled silks, 233; Cereals, 234; Cord, 234; Coal, 232; Leather work, 233; Stationery, 233; Medicines, 233; Pewter ware, 233; Seaweed, 234; Sea shells, 234; Teas, 234; Fish, 234.
 Iagaki, T., Chirikawa, R., Tomita, T., Nobashi, S., & Co., Cape, 237.
 Incerti, A., Knit goods, 219.
 Indermühle, E. T., Hats, 200.
 Indiana, State of, Educational Dept., 257.
 Industry Association in Krain, 66.
 International Bandage-shiff Factory, 201.
 Independent Comb Co., 128.
 India-Rubber Comb Co., 127.
 Ind, G. F., Wines, 163.
 Iniguez, D., Medicinal herbs, 250.
 Ingersoll & Hobart, Paper signs, etc., 131.
 Ingram, W., Granite clock case, 46.
 Iniguez, M. A., Stone, 100.
 Insp. Gen. of Penal Dept., Boots, 154.
 Inguaggiato, Baron Croce, Olive oil, 217.
 Inness, W. M., Cod-liver oil, 163.

- International Works, Brine, 47; Salt, 171.
 Inventors' Protective Assoc., Models, 266.
 Invernizza, J. & T., Silk, 248.
 Iowa, State of, School system, 238.
 Ipsen's, P., Widow, Vases, 209.
 Ipanema Iron Works, 97.
 Irmenbach's succ'r., G., Kid gloves, 195.
 Iron Clad Paint Co., 109.
 Ironton Furnace Co., Iron, 21; Iron ores, 15.
 Iron Works Honolulu, Machinery, 242.
 Irving Bros., Paper carpeting, 118.
 Isaacs, J., Furs, 129.
 Ishida, R., Crape, 238.
 Ishioka, S., Lacquer, 240.
 Iskizaka, S., Coal oil, 239.
 Ishardi, P., Olive oil, 217.
 Israel Bros., Millstones, 60.
 Isler, Aloyse, & Co., Hair goods, 200.
 Isler, Jacob, & Co., Straw goods, 200.
 Issmayer, J. A., 191.
 Itabapoana, Baron de, Chair, 244.
 Itaca Calendar Clock Company, Clock, 262.
 Ito, T., Silk, 239.
 Iturbe, F., Pharmaceutics, 249.
 Ivanhoe Manufacturing Company, Paper, 131.
 Ives Patent Lamp Company, 117.
 Ivins & Bro., Bed, 115.
 Ivins, Dietz, & Magee, Carpets, 123.
 Ivison, Blakeman, Taylor, & Co., Books, 260.
 Ives, Blakeslee, & Co., Garters, 129; Toys, 128.
 Ives, H. R., Hardware, 177.
 Ives, W. A., & Co., Tools, 135.
 Iwata, H., Glass eyes, 238.
 Iwari, G., Fancy work, 239.
 Iwashii, K., Lacquer, 240.
 J. M. Brunswick & Balke Co., Billiards, 115.
 Jaap, J., Essences, 142.
 Joa  ez, P., Lime, 100.
 Jaccard, E., Engravings, 200.
 Jack, J., Wheat, 156.
 Jackson Co., Cottons, 119.
 Jackson, C., Bricks, 173; Clay, 47; Sand, 47.
 Jackson Furnace, Iron, 21; Iron ores, 14.
 Jackson, W. H., & Co., Grates, 137.
 Jackfish Lake Gold Mining Co., 44.
 Jacoby, M., & Co., Laces, 147.
 Jacobini, Roffe, & Giobbedio, Precious stones, 219.
 Jacobsen, J., Varnishes, 214.
 Jacoby, T., Hats and Bonnets, 126.
 Jacobson & Anderson, Gloves, 212.
 Jacobs, Poelaert, & Co., Blankets, 203.
 Jacquot & Co., Blacking, 180.
 Jacquemin, Costumes, 185.
 Jacquand, Father and Son, Glues, 179.
 Jaescheke, G., Cigars, 151.
 Jaudin & Duval, Foulards, 183.
 J  necke Broth. & Schneemann, Colors, 188.
 Janentzky & Co., Artists' materials, 129.
 Jalsens, H., Match factory, 214.
 Jansen, Bodek, & Hertz, Silks, 199.
 Jansen, J. W., Clothes, 189.
 Jank, L., Pearl buttons, 196.
 Jamme, A., Thread, 203.
 Jannapes Forge, Foundry, and Rolling Mill Co., 74.
 James, W., Woods, 164.
 Janbert, Andras, & Co., Silks, 183.
 Jardine, Miss, Lace, 175.
 Jaruschka, J., Pearl buttons, 196.
 Jatta, A., Olive oil, 217.
 Jauernig, O. B., Pearl buttons, 196.
 Jawanski, F., Turners' articles, 196.
 Jeantaud & Co., Wheels, 186.
 Jeandron-Ferry, Ladies' shoes, 183.
 Jebben, P., & Co., Twills, 215; Flannels, 215.
 Jeffrey & Co., Wall paper, 148.
 Jeffreys, C., Show cases, 144.
 Jefferson Furnace Co., Iron ores, 14.
 Jefferson Furnace, Iron, 21.
 Jeffrey, F., Lace, 175.
 Jeffreys, J., Jewelry, 147.
 Jeffords, J. E., & Co., Earthenware, 112.
 Jennings Bros., Paperware, 139.
 Jennings, T., Magnesia, 141.
 Jennings, G., Terra cotta, 143; Baths, 145.
 Jennings, P. A., Rug and cuffs, 151.
 Jersey City Crucible Co., 18.
 Jernberg, S., Latches, 214.
 Jerome, S. B., Clocks, 262.
 Jervis, J. B., Drawings, 266.
 Jessup & Laflin, Paper, 130.
 Jessup & Moore, Paper, 131.
 Johnson, T. & J. W., & Co., Law books, 26.
 Judson Bros., Shirts, 124.
 Judd, H. L., Hardware, 138.
 Jujui, Province of, Slings, 249; Leather bag, 249; Caparisons, 250; Salt, 245.
 Julien, J., Son, Fabrics, 246.
 Jumeau, F., Dolls, 185.
 Jungfer, A., Amber, 60.
 Junge, A., Mattress, 114.
 Jung, O., Wines, 157.
 Jung & Simons, Clothes, 189.
 Jurie, A., & Co., Silks, 183.
 Jugla, D., Kid gloves, 183.
 Julien, A., & Co., Chemicals, 179.
 Jullien & Ganthey Bros., Cartridges, 185.
 Justice of the Peace, Ensenada, Shells, 100.
 Justi, H. D., Artificial teeth, 134.
 Justice of the Peace, Patagones, Gypsum, 100.
 Justice of the Peace, Zarate, Clays, 100.
 Jut  , J. C., & Co., Books, 167.
 Jujuy, Government of the Prov. of, Ores, 69.
 Jobst, H., Chemicals, 187.
 Jocelyn, H. L., Roofing, 47.
 Johns, H. W., Brushes, 139; Locks, 138; Asbestos roofing, 117.
 Johnson Bros., Colors, 142.
 Johnson, C. Eneu, & Co., Printing ink, 110.
 Johnson, C. J., Galena, 45.
 Johnson & Co., Pottery, 142.
 Johnson, E. S., Gold pens, 129; Toothpicks, 127.
 Johnson & Hamlin, Mattress, 115.
 Johnson, H. M., Fresco paint, 110.
 Johnson, J., & Co., Shell work, 147.
 Johnson, J., & Fildes, Quilts, 145.
 Johnson, Matthey, & Co., Metals, 29.
 Johnson, W., Tools, 135.
 Johnstone Brothers, Ores, 40.
 Johnston, E. S., Shade fixtures, 116.
 Johnston, H. J., Painting, 154.
 Johnstone, O'Shaunessey, & Co., Phot., 155.
 Johnson & Lund, Artificial teeth, 134.
 Johann, Anton Farin  , Chemicals, 177.
 Johann, Maria Farina, Chemicals, 188; Cologne, 188.
 Johansson & Carlander, Cottons, 212.
 Jolivet, L., Candles, 181; Wax tapers, 179.
 Joint Stock Association for Mining, and Lead and Zinc Manufacturers, 60.
 Joint Stock Chemical Works, 187.
 Joint Stock Co. for Manuf. Aniline, 187.
 Joint Stock Company, Metals, 60.
 Joint Stock Wagon Works, 192.
 Jonny, L. M., Bolts, 177.
 Jouvin & Co., Kid gloves, 183.
 Jones, F., Ashes, 245.
 Jones, G. W. C., Fern, 243.
 Jones, Ingold, & Co., Steel, 21.
 Jones, P., Flannels, 146.
 J  nk  pings Match Manufacturing Co., 211.
 Jouvin, Mrs. X., Kid gloves, 183.
 Jough, S. J., Snuff, 168.
 Joubert, W. A., Wine, 168.
 Jordan, C., Oil, 214.
 Jordis, C., Hair goods, 191.
 Jordan, W., Brushes, 215.
 Joslin, P. & W., Rubber and horn goods, 128.
 Joseph, V., Oils, 179.
 Jourvie, J. A., & Co., Waters, 48.
 Jowa, Delheid, & Co., Iron, 74.
 Kaberg, C. A., Wall paper, 213.
 Kaehler, O., Furs, 129.
 Kaffel Bros., Furniture, 181.
 Kahlbaum, C. A. F., Chemicals, 187.

- Kaines, J. H., Wines, 162.
 Kaiser & Herzog, Decorations, 114.
 Kaiserslautern Ultramarine Works, 187.
 Kaldenberg, F. J., Meerschaums, 128.
 Kalla, J., Stove, 193.
 Kamaipelekane, E. P., Bed, 242.
 Kanada, Yashiro, Kitagawa, Ariki, Hano, Takuma, Yamada, Yoshikawa, & Co., Silks, 238.
 Kanaya, G., Nakagawa, G., & Co., Bronzes, 238.
 Kangiorio, Silk, 237; Tea, 238.
 Kann & Sons Mfg. Co., Spoons, 116.
 Kanzan, D., Porcelain, 237.
 Karcher's, D. M., Sons, Furniture, 114.
 Kasson, W. M., Public comfort, 266.
 Kasten, H. W., Petroleum, 60.
 Katayama, G., Brocades, 237; Paper work, 238.
 Katzunari, Lugiya, 236.
 Kaufman, A. & C., Paper collars, 190.
 Kauffmann, C., Coverlets, 189.
 Kaulek, A., Colorings, 180.
 Kautsky, I., Buttons, 196.
 Kawahara, R., Bronzes, 238.
 Kawaimui, J. U., 241.
 Kawamura, Y., Bronzes, 238.
 Kawashima, G., Thread, 239.
 Kay & Bro., Books, 261.
 Kcaloha, Kapa, 242.
 Keasbey & Mattison, Pills, 107.
 Kees, E., Fans, 185.
 Kehoc, L., General literature, 261.
 Keiss, P., Meerschaum pipes, 196.
 Keim, Beverly R., Minerals, 16.
 Keissbarth, G. C., Brushes, 192.
 Keizer, C., & Son, Furs, 175.
 Keller, A., Raw silk, 218.
 Keller, C., 191.
 Keller & Alt, Clothing, 194.
 Keller, H., Silver ware, 190.
 Kelley, J. B., & Co., Paints, 110.
 Kelly Bros. & Co., Buggies, 178.
 Kelly, Dr., Wines, 163.
 Kelly, J., Lithographic stones, 47.
 Kelly, T., Books, 260.
 Kelsey, J. E., Hops, 162.
 Kemp, W., Mats, 162.
 Kemper, J. A., Trimmings, 124.
 Kemperling, H., Turners' articles, 196.
 Kemperling Sons, Silk ribbons, 195.
 Kennedy Bros., Coal and clay, 40.
 Kennedy Bros., Bricks, 163.
 Kennedy, T., & Bro., Bridal costume, 126.
 Kent, F., Tie fastener, 178.
 Kent, G. B., & Co., Brushes, 150.
 Kentucky Geological Survey, 14.
 Keppler & Irmao, Chairs, 244.
 Kerkhoven, R., Painting, 206.
 Kerl's Heir, F. A., Plated ware, 194.
 Kerlitzky & Son, Garnets, 195.
 Kerne & Lang, Armchairs, 244.
 Kerns, H. G., Surgical instruments, 134.
 Kerr, N. M., & Co., Paper boxes, 131.
 Kerr, E., Stable lamps, 144.
 Kersch, M., Garnets, 195.
 Ketchum, E. K., Albertite, 45.
 Keuffel & Esser, Scientific instruments, 261.
 Kew, W., & Son, Carriages, 177.
 Keyless Padlock Co., 138.
 Keynes, J., Wools, 158, 163.
 Keys, J., Coal, 17.
 Keystone Bridge Co., Pivot bridge, 20.
 Keystone Flint Glass Co., 113.
 Keystone Furnace Co., Iron ores, 14; Iron, 22.
 Keystone Iron Co., 15, 20.
 Keystone Paint Co., 109.
 Khedive, Estate of the, Cottons, 226.
 Kibitz, G., & Sons, Smoking requisites, 196.
 Kidded, J., Electross, 263.
 Kiehle, A., Plated ware, 191.
 Kieling, J., Mechanics, 191.
 Kien, M., Window fastenings, 194.
 Kilby, R. H., Rifle, 176.
 Kilgore, D. Y., Blinds, 116.
 Kilgoren Bros., Paper bags, 175.
 Kilian Bros., Tables, 114.
 Kilner Bros., Bottles, 143.
 Kimbel, M., Furniture, 188.
 Kimble, A., & Cabus, Furniture, 114.
 Kimes, J. B., & Co., Mantels, 17.
 Kimoura, G., Crape, 238.
 Kimoura, Sumii, & Yamada, Fans, 238.
 Kimpton, T., Regulators, 145.
 King, A., & Co., Rum, 171.
 King Bros., Firebrick, 143.
 King & Brown, Boots, 175.
 King Iron Bridge Company, 265.
 King, J., & Son, Tools, 135.
 King, J. M., & Co., Dies, 138.
 King Philip Mills, Cottons, 118.
 King, W., Woolens, 146.
 King, W., Son, & Co., Petroleum, 108; Oils, 109.
 Kingsbury, T., Razors, 149.
 Kinkosan, S., Faience, 237.
 Kinmond & Co., Magnesia, 141.
 Kinross & Co., Cordage, 164.
 Kipling's, R., Sons, Precious stones, 127.
 Kirby, Beard, & Co., Pins and needles, 148.
 Kirkpatrick Quarry, 46.
 Kirschner, Glass articles, 193.
 Kirschner, A., Glass articles, 196.
 Kitakase, Mrs., Vinegar, 240.
 Kitaoka, H., Silk pictures, 237.
 Kitchen & Sons, Candles, 153.
 Kithil, A., 191.
 Kittaning Coal Co., 16.
 Kittig, J., Bronze goods, 196.
 Kittelsen, J., Valises, 215.
 Kittle, S. P., Mattresses, 114.
 Kittredge Cornice and Ornament Co., 139.
 Kiyouridzu, H., Porcelain, 237.
 Kiyouridzu, K., Faience, 237.
 Kiyomidzu, R., Porcelain, 237.
 Klammerth, A. Z., Majolica work, earthenware, 193.
 Klautscheck, Thomas, & Stewart, Glass, 112.
 Kleeburg, A., Metal articles, 195.
 Klein, Logan, & Co., Tools, 135.
 Klein's Sons, T., Leather fancy goods, 197.
 Kleinschluster, A., Shoes, 195.
 Klemetsen, C., Fittings, 215.
 Klint, Bernhardt, & Co., Varnishes, 211.
 Klintberk, J. W., Marble, 84; Jewelry, 213; Petrifications, 213.
 Kluge & Pöritzsch, 188.
 Knabe, Wm., & Co., Pianos, 265.
 Knapp, A. E., Bible, 261.
 Knell & Co., Chairs, 113.
 Knepper, W., Paper, 197.
 Knight, F. P., 232.
 Knight J. G., Hair string, ornaments, 161; Barks, 162.
 Knight, Miss Mary, Bedstead, 144.
 Knight & Widden, Plaster, 19.
 Knops, A., Cloths, 189.
 Knowlton, J. J., Inks, 110.
 Knox & Chain, Instruments, 262.
 Koch, M., Woolens, 194.
 Koch & Bein, Letters, 192.
 Koch & Bergfeld, Plated ware, 191.
 Koch, Sons, & Co., Albums, 127; Stationery, 130.
 Kochs, G., Rope, 192.
 Kock, F., Pearl buttons, 196.
 Kockum, F. H., Utensils, 212; Nails, 214.
 Kodama, H., Bamboo work, 239.
 Korb, V., Laces, 195.
 Koechling, B. H., Chairs, 114.
 Koepf, Rud., & Co., Chemicals, 187.
 Kohei, Makiyama, 236.
 Kohl, A., Hemp hose, 198.
 Kohler, I., Bookbindings, 131; German books, 260.
 Kohler, M., Knee rest, 135.
 Köhler & Co., Cards, 213.
 Kohn, J. & J., Furniture, 193.

- Kohn, M., Gloves, 126.
 Kohn, T., Braids, 124.
 Kohn & Co., Shoes, 195.
 Kojima, S., Fishing tackle, 238.
 Kolb, G. F., & Son, Jewelry cases, 129.
 Kolb & Schüle, Linens, 189.
 Kolbe, D. W., Surgical instruments, 134.
 Komoura, K., Buildings, 238.
 Kompff, P., Drums, 265.
 Kondo, M., Yoda, Y., Soap, 237.
 Kongsberg Silver Mines, 88.
 König, J. C., & Ebhart, Books, 191.
 Koolemans-Beignen, Pottery, 205.
 Kopsch, H., Porcelain and screens, 233.
 Kopyrarberg's Factory, Ores, 84.
 Körner & Co., Lamps, 189.
 Körner, F., & Co., Matches, 211.
 Král, F. S., Soap, 192.
 Kramer, J. H., Lanterns, 117.
 Kranich & Bach, Pianofortes, 265.
 Kraul & Bier, Silverware, 190.
 Krauliz, M., Frames, 193; Jewelry, 196.
 Krause, H., Maps, 266.
 Krebs, F. E., Kid gloves, 190.
 Krehan, J., Pearl buttons, 196.
 Kreishcher, B., & Son, Fireclay, 18; Fire-bricks, 111.
 Kreitzer, M. C., Medicines, 107.
 Kreuger & Jennings, Matches, 211.
 Kreutznac, E., Hosiery, 190.
 Krider, J., Guns, 133.
 Krider, P. L., Silverware, 116.
 Krins, E., Carvings, 202.
 Kroedel, Franz, Chronometer, 262.
 Krol, W., Plasters, 206.
 Kropp, J. P., Cottons, 189.
 Krogstad Society, Nails, 215.
 Krueger, C. F., Dressing table, 113.
 Krug, J. M., Silver ware, 190.
 Krull, E., Tallow, 243.
 Krupp, F., Products of mines, 60.
 Kubik, J. N., Skins, 198; Leather gloves, 195.
 Kubli, G. G., Straw hats, 219.
 Kubota, Matano, Fukui, Hadno, Inagaki, Kitagawa, Matano, Tanaka, Nakashima, Chiba, Tanaka, Nishimura, Kitaoka, Kimura, Asano, & Co., Lacquer, 238.
 Kuehn, H., Embroidery patterns, 190.
 Kuebler, W., Instruments, 261.
 Kühn's Wire Factory, 188.
 Kullgrens, C. A., Widow, Granite, 84, 213.
 Kuhne, W., Basket ware, 216.
 Kumagai, K., Bronzes, 238.
 Kunheim & Co., 188.
 Kunschke, F., Pearl buttons, 196.
 Kuntze & Co., Filters, 212.
 Kurlbaum & Co., Camphor, 108.
 Kurr-Schüttner, C., Silver ware, 190.
 Kursheedt & Co., Rufflings, 126.
 Kurzhalss, J., Fruit syrups, 198; Oils, 193.
 Kurzel, I., & Jankowsky, C., Turners' articles, 196.
 Kely, G. L., & Co., Fringes, 124.
 La Belle Glass Co., 113.
 Labonia, B. G., Licorice, 216.
 Laborda, F., Waters, 246.
 Labriola, L., Tortoise shell, 219.
 Lace Manufacturing Co., Venice, 219.
 Lacey, R. G., Rockets, 142.
 Lachard Bros., & Co., Silks, 183.
 Lackawanna Iron and Coal Co., 14, 21.
 Lacmarr, J., & Sons, Doll bodies, 127.
 Laconia Co., Cottons, 119.
 Laconia, F., Essences, 217.
 Lacour, G., Orthopedics, 250.
 Lacroix, A., Colors, 180.
 Lacroix Bros., Papers, 185.
 Lagerbäck, H., Locks, 214.
 La Ensenada, Justice of the Peace of, Sarsaparilla, 250.
 Lagos, J. M., Maxwellina, 249.
 Laidlaw, A., & Co., Plumbers' ware, 177.
 Laidlay, J., Wheat, 156.
 Lair, E., Papers, 185.
 Laird, W., & Co., Textile fabrics, 145.
 Lake George Antimony Co., 48.
 Lake Superior Iron Co., 14.
 Lalance & Grosjean Mfg. Co., Iron ware, 137.
 Labor, T., & Sons, Lock, 177.
 La Lys Co., Thread, 203.
 Lamary, Watch guards, 183.
 Lamarre, Fancy articles, 185.
 Lamb, J. & R., Furniture, 113.
 Lambert, L., & Co., Glass, 202.
 Lambert, C., Son, Glass, 202.
 Lambeth, S. W., Fly fan, 129.
 Lambie & Sargent, Tables, 113.
 Lamm, A. M., Galvanics, 213.
 Lafargue, P., Engravings on metals, 144.
 Laferis, F., Cutting tools, 198.
 Laffiteau & Rieger, Arms, 185.
 Laffin & Rand Powder Co., Electrics, 263, 111.
 Lafquist, J. A., Irons, 212; Hinges, 214.
 Lancaster, A., Guns, 148.
 Lancaster, C., Guns, 148.
 Lancaster Mills, Gingham, 121.
 Lancaster, Thompson, & Co., Pews, 115.
 Lancetti, F., Furniture, 218.
 Lancia di Brolo, Duke Federico, Sea salt, 216.
 Lancroft, C. H. & H. B., Sulphates, 23.
 Landenberger's, M., Sons, Hosiery, 126; Woolens, 122.
 Languist, S. & K., Vessels, 214.
 Lands and Agric., Melbourne, Dep. of, 155.
 Landskrona Manuf. Co., Wool fabrics, 212.
 Lane Manufacturing Co., Metal goods, 128.
 Lane, T. G., Washing crystals, 171.
 Lang, J. & J., Instruments, 149.
 Lang, J., & Sons, Guns, 149.
 Lang, W., Wools, 158.
 Lang, J., & Co., Meerscham articles, 196.
 Lang & Co., Soap, 243.
 Lang, L., Soaps, 243.
 Langdon Manufacturing Co., Cottons, 120.
 Lange, Little, & Co., Printing, 131.
 Langen, Kruchen, & Borrenkott, Cottons, 189.
 Langevin, A. B., Marble, 46.
 Langwish, B., 188.
 Lanieri, M., Soap, 246.
 Lanza Bros., Candles, 216.
 Lapaine C., Bobbinet, 195.
 Laperche, Marble, 181.
 Lapworth Bros., Carpets, 146.
 Lapp, C., Milk, 201.
 Lapp, F., Clock case, 262.
 Lardera, A., Perfumery, 217.
 Larahona, P., Seed, 250.
 La Rioja Prov. Commission, Minerals, 99; Lime, 100; Chalk, 101; Shawls, 247.
 La Rioja, Province of, Salt, 245; Shawls, 247; Lace work, 248; Hair chain, 249.
 Laroche, A., Cotton, 182; Vegetable paste, 185.
 Larsbo Norns Stock Co., Ores, 84; Iron, 85.
 Larsson, P. M., Iron, 85.
 Larsen, N. F., Gloves, 209.
 Larsen, G., Pipes, 215.
 Larvelle, J. H., Bridges, 266.
 Las Conchos Public School, Arg. Rep., Embroideries, 249.
 Lastbom, J., Cupboard, 212.
 Latham, E., Ale, 157.
 Latrobe Furnace, Iron ores, 14; Iron, 22.
 Laube, R., Clothing, 194; Bathing hats, 195.
 Laurent & Decker, Annunciators, 263.
 Lantier's Son, Perfumeries, 180.
 Laurel Furnace, Iron ores, 14; Iron, 22.
 Laurenaudiere, F., Ink, 180.
 Laurie, W. & L., Arrowroot, 152.
 Lavaggi, F., Matches, 218.
 Laval, G. de, Velocipedes, 214.
 Lavers, Alfred H., Cement, 29.
 Lavoie, M., Hair work, 175.
 Law, J., Crucibles, 47; Brass work, 177.
 Lawlor & Co., Washing machine, 174.
 Lawrence Furnace Co., Iron ores, 14; Iron, 21.
 Lawrence, A. R., Soda waters, 19.
 Lawson & Goodman Manf. Co., Cutlery, 136.

Laxa Stock Co., Ores, 84.
 Layton, F., Soap, 150; Furs and rug, 151;
 Castor oil and beeswax, 152.
 Lay, E., Metal ware, 191.
 Leao & Alves, Perfumery, 243.
 Leblanc, J. H., Feathers, 175.
 Lederer, R., Glass trinkets, 196.
 Ledig, A., & Son, Silver ware, 116.
 Leedom, Shaw, & Stewart, Carpets, 123.
 Ledoux, B., Landau, 178.
 Ledward, J., & Son, Cassimeres, 121.
 Ledyard, T. D., Magnetite, 44.
 L'Eclair Joint Stock Co., Tapers, 202.
 Leclercq, Widow, Lace, 204.
 Lecornu, Lace, 184.
 Lecloux, G. J., Cloth, 203.
 Lecoq-Lamotte, Lace, 184.
 Lee, Alfred S., Iron ore, 14.
 Lee, R. J., Disinfectant, 149.
 Lee Bros., Bricks, 172.
 Lee & Shepard, Books, 261.
 Leeds Paint Mfg. Co., 172.
 Leeds, L. M., Ventilation, 266.
 Lefebvre, F., Green water, 179.
 Legaré, J. B., Carriages, 178.
 Legrady, J., Glass cutters, 66.
 Lehigh Zinc Co., Ores, 13; Zinc, 20.
 Lehigh Valley Iron Co., Ores, 15; Iron, 20.
 Lehigh Iron Co., Ores, 15; Iron, 20.
 Lehigh Slate Co., 17.
 Lehigh Whetstone Co., 19.
 Lehigh Shovel Works, 138.
 Lehmann, H., Kid gloves, 190.
 Lehnert, H. G., Orchestral instruments, 264.
 Leidy, Francis D., Soap powder, 108.
 Leiner, M., Surgical inst., 133; Brushes, 139.
 Lejeune-Vincent, H. J., Cloth, 203.
 Lennon, H., Plow, 158.
 Lemos, P. L. & M., Gold dust, 97.
 Lemos, T., Minerals, 97.
 Lemos, A., Minerals, 99.
 Lendenberg, B., Lime, 97; Sea salt, 243.
 Lenégre, A., Albums, 185.
 Lenier, M., Ear cleaners, 127.
 Lenoir, P., Corsets, 183.
 Lenon, T., Cordage, 164.
 Lent, W., Iron, 79.
 Leonhard, T., Beeswax, 128.
 Leoni, A., Costumes, 219.
 Leopardi-Rossi, Cav. Cesard, Soaps, 217.
 Leopardo, R. C., Cesare, Ropes, 220.
 Le Page, Essences, 243.
 Lerch, A., 393.
 Lerl & Sons, Frames, 193; Bronze articles,
 196.
 Leroy, Mrs., Lace, 184.
 Leroux, G., Millstones, 17.
 Lesar, W., Table, 167.
 Lesjöfors Stock Co., Ores, 84; Iron, 85.
 Leslie, R., Clay, 47.
 Letang, T. I. B., Moulds, 181.
 Lettersteat & Co., Flour, 169.
 Leurant, E., Glass, 202.
 Levallée, N., Limestone, 46.
 Levantens Dye Works, 211.
 Level, L., Gloves, 203.
 Lever Spring Bed Company, 113.
 Levilion, Ladies' costumes, 183.
 Levy, J., Jewelry, 184.
 Lewald, H., Wadding, 180.
 Lewenkaupt, S., Count, Pulp, 213.
 Lewis, Magnetite, 45.
 Lewis Bros., Flour, 152; Wheat, 151.
 Lewis, John T., & Bro., Chemicals, 107.
 Lewis, J., Carpets, 146; Quartz, 161.
 Lewis, L., Limestone, 46.
 Lewis, Oliver, & Phillips, Iron, 22; Hard-
 ware, 138.
 Lewis & Willett, Stone vases, 18; Knife polish,
 36; Baking powders, 153.
 Leykauf, G., Stones, 192.
 Leyneu Hougaerts, J. A. H., Vestments, 203.
 Leypoldt, F., Publishers, 261.
 Leyser, W., Agates, 190.

Lexington & Carter co. Mining Co., Coal, 16.
 Liadalens Co., Powder, 214.
 Liardet, H. E., Fancy articles, 163.
 Libe, John, Yeast powder, 108.
 Liberg, B. & O., Tools, 213.
 Lichtenfelder, Steel seats, 181; Tools, 186.
 Lie, P. A., Filigree work, 215.
 Lien Shing, Jewelry and furniture, 233; Lac-
 quer ware and ivory, 234.
 Lighte & Ernst, Piano fortes, 265.
 Likly, McDonald, & Rockett, Fancy leather
 work, 129.
 Liljeholms Stearine Mfg. Co., 211.
 Lillela, Ink, 243.
 Lilley, M. C., & Co., Masonic supplies, 139.
 Lilloe, J., Harness, 216.
 Limet, Lapareille, & Co., Files, 186.
 Limousin & Co., Capsules, 179.
 Limousin, Pharmaceutical preparations, 179;
 Machine, 186.
 Lincoln Furnace, Iron ores, 14; Iron, 22.
 Lincoln, Bennett, & Co., Hats, 147.
 Lindberg, L., Iron, 85; Ores, 84.
 Lindalil, J. P., Matches, 211.
 Lindenbauer, O., Chemicals, 187.
 Linden Steam Mills, Velvet, 190.
 Linderman, G. B., Coal, 16.
 Linderman & Co., Fertilizing salts, 60.
 Linderman, C., Corks, 192.
 Lindley, Robert C., Stone, 29.
 Lindner, E., Laces, 195.
 Lindsay, J. A., Ores, 44.
 Lindsay & Blakiston, Bindings, 131; Books,
 261.
 Lindsay & Anderson, Terra cotta, 143.
 Lindström, J. F., Hardware, 214.
 Lintelo, A., Clocks, 202.
 Lippincott, C., & Co., Soda water apparatus,
 19.
 Lippincott, J. B., & Co., Publishers, 260.
 Lippitt Woolen Co., Woolens, 122.
 Lipman, H. L., Eyelet machines, 129.
 Lithographic Stock Co., Envelopes and books,
 213.
 Littleton Saranac Buck Glove Co, 126.
 Little, T. W., & Co., Woolens, 146.
 Liver Alkali Works, 141.
 Liverpool Spun Oakum Co., 149.
 Lobo, T., Clay, 101.
 Lobb, J., Boots, 147.
 Lohmeyr, I. & L., Glass articles, 193.
 Local Committee, Cape of Good Hope, Beer,
 catalogue, articles of dress, and Knobe kie-
 rie, 167; Skins, feathers, and models, 168.
 Locati, C. A., Carriages, 220.
 Lochbaum, N., Album, 191.
 Lockhart, A. M., & Co., Billholders, 130.
 Lockwood, W. P., Gold, 44.
 Lodholz, F., Plated ware, 191.
 Lodi, G. B., Gloves, 219.
 Loeber, G., Stationery, 206.
 Loeflund, E., Chemicals, 187.
 Loehner Bros., Embroideries, 200.
 Löfvenskiöld, S., Ores, 84; Iron, 85.
 Logan Furnace Co., Iron ores, 14; Iron, 22.
 Logemann, F., Gloves, 194.
 Lohmann & Söding, Steel ware, 60.
 Lohner, J., & Co., Carriages, 198.
 Lohse, G., Chemicals, 188.
 Loiseau, A., Son, Toys, 185.
 Lommen, C. H., Glass, 205.
 Londley, Sandstones, 46.
 Longmire, T., Flax, 157.
 Lonitz, H., Clay goods, 188.
 Lonman, J., Screen, 205.
 Lonsdale Company, Cottons, 118.
 Lonsbergh, V., Colors, 205.
 Lönseth, F., Millstones, 88.
 Looking-glass Manufacturers of Germany, 188.
 Loonen, F., Brushes, 185, 187.
 Loos, A., Marble, 66.
 Lopez, F., Clay, 100.
 Loper & Doughten, Naval stores, 108.
 Lopez, S., Stone tables, 218.

- Lopez, F., Coconut rings, 249; Medicinal herbs, 250.
 Lord, J. E., Spring bed, 115.
 Lorenz Bros., Perfumes, 111.
 Lorenz, G., Basket ware, 192.
 Lorenzen, L., Cordial, 210.
 Lorilleux, C., Inks, 180.
 Lorin, A., Stained glass, 181.
 Loser Bros., Mineral water, 66.
 Loth, H., Tables, 113.
 Louderback, E., Shades, 116.
 Louis, Julius, & Bro., Oil stones, 19.
 Louisson, T. B., Ores, 40; Paint, 163.
 Lucas, J., & Co., Chemicals, 109; Glass, 112.
 Lucas, B., & Co., Woolens, 123.
 Lucas Bros., Cloths, 189.
 Lucy Furnace Co., Ores, 13; Pig metal, 20.
 Ludwig, Schmidt, & Mohl, Enamel, 134.
 Luder & Leidloff's Suc., Chemicals, 183.
 Lugsden & Barnett, Saddles, 178.
 Lukarch, J., Pearl buttons, 196.
 Luksch, J., Fancy articles, 196.
 Lloyd Bros., Shade fixtures, 116.
 Lloyd, H. C., Magnetite, 44.
 Lloyd, Supplee, & Walton, Fluting machines, 117; Tools, 136.
 Lummerzheim, M. H., & Co., Lampblack, 201.
 Lundgren, P. W., Ink, 111.
 Luriens-Eliaert, Thread, 203.
 Lurssen, G., Corks, 192.
 Lustig & Vidor, Mosaic articles, 196.
 Luttensee, G., Stone, 88.
 Luthringer, Silks, 183.
 Lutton, A., Chasubles, 183.
 Luttringer, C., Frames, 181.
 Lux, K., Bronze articles, 196.
 Lovatt, W. N., Porcelain, 233.
 Lovegrove, W., Maize, 151.
 Lovell, F. H., & Co., Lamps, 117.
 Lovell, G. H., & M. F., Ear brush, 139.
 Lovel, J. P., & Sons, Revolvers, 132.
 Lovers Manufacturing Co., Matches, 211.
 Low, A. H., Wools, 152.
 Low, Son, & Haydon, Brushes, 149; Extracts, 142.
 Lowe, A. C., Frames and mirrors, 115.
 Lowe, N. M., Orrery, 261.
 Lowentrant, P., House furnishing, 117.
 Lowell Bleachery, 119.
 Lowell Hosiery Co., 125.
 Lowell Manufacturing Co., Carpets and serges, 123.
 Lowenfeld, W., Shawls, 94; embroidery, 195.
 Lowenstein, A. R., Fancy shoes, 195.
 Lowenthal, E., Glass trinkets, 190.
 Lowentrant, P., Tools, 136.
 Lowerre & Tucker, Fluting machines, 117.
 Lowthorp, F. C., Plans of bridges, 265.
 Lyman Mills, Cottons, 119, 120; Flannels, 123.
 Lyman, Clare, & Co., Oil and pharmaceuticals, 171; Paints, 172.
 Lyman Bros., Pharmaceuticals, 171.
 Lyman, S. J., Perfumery and soap, 172.
 Lyman, F. S., Saddle, 242; Leather, 243.
 Lynch & Co., Instruments, 149.
 Lyon, G., Lemonade, 36; Tomato sauce, 157.
 Lyon, S., Locks, 138.
 Lyon, Woods, Buggies, 177.
 Lyons, W., Inks, 142; Sealing wax, 148.
 Lyons, Cottier, & Co., Glass, 150.
 Maasen-Zonen, A. E., Nets, 205.
 Mabie, Todd, & Baird, Toothpicks, 128; Gold pens, 130.
 Mabile, A., Books, 167.
 Mabile, V., Iron, 74.
 Macarthur, Sir W., Woods, 151.
 Maccagnani, U., Earth, 94.
 Macdonald, Field, & Co., Granite, 29.
 MacIntosh, J., Decorative doors, 144.
 Mack, E., Chemicals, 187.
 Mackay, J., Varnishes, 142; Articles of diet, 149.
 Mackeown, Bower, Ellis, & Co., Drugs, 108.
 Mackinley, A. & W., Blank books, 176.
 MacKunion, J. C., Iron ores, 45.
 Macready, H. A., Brass wire cloth, 118.
 Madini, Augusto, & Co., Seamless bags, 218.
 Madoeno, J., Gloves, 248.
 Maes, G., Woolen fabrics, 182.
 Mage, senior, Woven wire, 186.
 Magee, D., & Co., Hats, 175.
 Magnetic Iron Co., 13, 20.
 Magnus, G., & Co., Balls, 188.
 Magnet, Stationery, 185.
 Mahler, M., Furs, 129.
 Mahmoud Bey, 223.
 Mahony, M., & Bro., Woolens, 146.
 Mahr, F., Pearl buttons, 196.
 Maia, Ferreira, & Co., Pharmaceuticals, 243.
 Main Manufacturing Co., Lamps, 117.
 Maine Red Granite Co., 17.
 Maine Slate Co., 17.
 Maine, State of, School system, 258.
 Mainetti, F., Carriage, 220.
 Mains Manufacturing Co., Dice box, 128; Petroleum tester, 261.
 Mairlot & Heuse, Gun barrels, 204.
 Makemura, S., Lacquer, 240.
 Malcolm, R., Saddlery, 178.
 Malcom & Stevenson, Flavors, 110.
 Malentim, M. T., Jewelry, 244.
 Mali, H. W. T., & Co., Woolen cloths, 182.
 Mallory, Jas. E., Marble, 17.
 Mallory, Wheeler, & Co., Locks, 137.
 Malmö Mfg. Co., Yarns, 212.
 Malmö Soap Factory, 211.
 Malmö Wood Mfg. Co., 213.
 Malmö Woolen Mfg. Co., 212.
 Maltby, Curtiss, & Co., Nail puller, 135.
 Maltête, Toys, 185.
 Manchester Mills, Prints, 121; Worsteds, 123.
 Manchester, Robertson, & Co., Shirts, 175.
 Mangeri, A., Cloths, 218.
 Manhattan Brass Co., 23.
 Manhattan Piano Forte Co., 264.
 Mann, W., Blank books, 131.
 Manning, Bowman, & Co., Plated ware, 116.
 Mansfield Shire Council, Stone, 36.
 Mansilla, M., Quartz, 99.
 Mansilla, M. T., Copper, 101.
 Mansuy-Dotin, Jules, Furniture, 181.
 Mantel, E., Pearl buttons, 196.
 Mantilla, C., Cotton fabrics, 247; Fabrics, 247.
 Manuvilling, J. J., Matches, 172.
 Maplestone, C., Wine, 157.
 Maranhao, Province of, Pharmaceuticals, 243; Hats, 244; Vases, 244; Chair, 244.
 Marais, H. H., Liquors, 169.
 Marias & St. Marie Paper Mills, 185.
 Maranesi, G. & M., Ink, 217.
 Marble, J., & Co., Indigo dye, 110.
 Marchand, J., Furniture, 180.
 Marchand, L. L., Bronzes, 181, 186.
 Marchese della Favare, Olive oil, 217.
 Marchesini, P., Straw hats, 219.
 Marchini, C. F., Straw works, 220.
 Marcotte, L., & Co., Furniture, 113.
 Marga, E., Marble, 181.
 Margani-Valenti, G., Medicines, 220.
 Margarey, T., Flour, 162.
 Marienberg Blue Color Works, 187.
 Mariette, Bey, 223.
 Marini Marq., Pietro, Olive oil, 217.
 Marion Blind Co., 117.
 Marks, A. A., Artificial limbs, 133.
 Marks, T., Ores, 44.
 Markhauer, A., Pyrolusite, 45.
 Markowitsch & Scheid, Trinkets, 195.
 Marling & Co., Woolens, 146.
 Marquart, L. C., Chemicals, 187.
 Marques, junior, Bath Tub, 244.
 Marquise Iron Co., 186.
 Marrison, R. D., Soap powder, 141; Fire arms, 149.
 Marsh, J. P., Health lift, 266.
 Marshall, J., Ales, 152.
 Marshall Bros. & Co., Galvanized iron, 119.

- Marshall & Co., Linen threads, 145.
 Marshall & Oxford, Fastener, 176.
 Martens & Baumer, Leather articles, 197.
 Marthaus, A., Felt goods, 189.
 Martillaro, Mar, Carlo, Olive oil, 217.
 Martin, C., Stove polish, 47, 172.
 Martin, G., Sugar, 152.
 Martin, F. O., Granite, 17.
 Martin, H. F., Slate, 17.
 Martin, J., Wines, 163.
 Martin, J. B., Silks, 183.
 Martin, L., Ornaments, 186.
 Martin, L., & Co., Lampblack, 110.
 Martin, P. J., Malt, 156; Ale, 157.
 Martin, W. H., Umbrellas, 148.
 Martines, F., Olive oil, 217.
 Martinotti, L., Carved furniture, 218.
 Martins, W., Leather gloves, 195; Skins, 198.
 Martorana, P. S., Sea salt, 216.
 Marunaka, M., Faience, 237; Bronzes, 238; Lacquer, 238.
 Marx Bros., Scissors, 136.
 Marx & Rawolle, Varnishes, 108.
 Marzi Bros., Poggibonsi, Olive oil, 217.
 Masaki, C., Artificial fruits, 239.
 Masashi, Shioda, 236.
 Maseurand Bros., Jewelry, 184.
 Mason, C. F., & Co., Cassimeres, 122.
 Mason & Co., Stationery, 130.
 Mason & Hamlin Organ Co., 264.
 Masonic Pub. Co., Books, 261.
 Massachusetts, Commonwealth of, Dept. of Education, 259.
 Massachusetts Cotton Mills, 119.
 Massmann, F., Cornices, 189.
 Masuda, G., Scales, 239.
 Masury, J. W., & Sons, Colors, 110.
 Match Manufacturing Co., 211.
 Mathers', G., Sons, Printing Inks, 110.
 Matherson & Gilice, Hematite, 45.
 Mathijssen, A., Plaster, 206.
 Mathushek Piano Co., 265.
 Martier, H., & Co., Linens, 145.
 Matlack, H. S., Paper hangings, 114.
 Matsuo, E., Bamboo, 238.
 Matsuo, Wakai, & Co., Tokio porcelains, 239.
 Mattaldi, E., Sofa trunk, 249; Harness, 250.
 Matthes, W. E., Ammonia, 205.
 Matthew, E., Stained glass, 144.
 Matthews, J., Pottery, 142.
 Matthiessen & Hegeler Zinc Co., 32.
 Maurer & Hervier, Tiles, 111.
 Mauser & Haid, Stone, 18.
 Mavernay & Co., Silks, 183.
 Mauville Co., Cottons, 119.
 Maw & Co., Tiles, 143.
 Mawson, E. S., & Sons, Furs, 129.
 Maxton, Robert, & Co., Laccs, 184.
 May, J. M., Silk, 152.
 Mayaud Bros., Religious articles, 181; Ornaments, 185.
 Maydole, D., & Co., Hammers, 135.
 Mayer, G., Gloves, 230.
 Mayer & Meltzer, Instruments, 149.
 Mayer, M., Envelopes, 191.
 Mayer, S., & Co., Linens, 189.
 Mayer's Art Institution, Statutes, 188.
 Maynard & Noyes, Inks, 110.
 Mayo, M. C., Planes, 135.
 Mayr, A., Fans, 196; Leather articles, 197.
 Mazaroz, R., Furniture, 181.
 Mazullo, C. A., Rock salt, 216.
 Muzzullo, Cav. Luigi, Olive oil, 217.
 McAlpine, Wm. J., Engineering, 266.
 McAusland, J., Stained glass, 173.
 McBride, R., & Co., Cottons, 145.
 McCammon, W. M., Piano fortes, 264.
 McClces, J. E., & Son, Mirrors, 115.
 McClement Bros., Cards and labels, 131.
 McClintock, I. R., Asphaltum, 16.
 McCloskey, Bro., & Co., Paints, 110.
 McConnell, Mrs. J. A., Stockings, 174.
 McCoy, Prof., Animals, 156.
 McCraie & Co., Hosiery, 174.
 McCready, G. W., Calendar, 175.
 McCrossan & Farr, Handkerchiefs, 121.
 McCullough Iron Co., 20, 139.
 McDermott, J., & Co., Stone, 18.
 McDonald, Mrs. D. B., Tapestry, 174.
 McDonald, Alexander, Rock work, 17.
 McDonald, D., Photograph, 155.
 McDonald, G. J., Sandstones, 46.
 McDonald, J., Piano forte, 265.
 McDonald, J. H., Stone, 47.
 McDonald, R. A., Coal, 45.
 McDonald, R. N. Gypsum, 47.
 McDonald, Kline, & Co., Underwear, 126.
 McDougall, J., Iron ore, 45; Sandstone, 47; Iron, 48.
 McDougall, J. & Sons, Iron, 48; Ochres, 172.
 McDowell, N., Minerals, 99.
 McElroy, C. J., Syringes, 134.
 McElroy, T., Surgical furniture, 133.
 McEwan, J., Sideboard, 153.
 McDermott, J., & Co., Stone, 18.
 McFadden, G., Cornets & trombones, 264.
 McFarlane, A., Wool, 163.
 McFarlane, P., & Son, Hubs, 178.
 McFarlane, P., Carriage, 178.
 McFarlane, W., Harness, 178.
 McGaw & Burnet, Sideboard, 173.
 McGee, J. G., & Co., Ulsters, 147.
 McGie, J., & Co. Nickel ore, 36.
 McGill, G. W., Paper fasteners, 129.
 McGregor, Sandstones, 46.
 McGregor, D., Clay, 47; Bricks, 172.
 McIlvaine, C., & Co., Printers' ink, 109.
 McIlvaine Bros., Drugs, 108; Facings, 112.
 McIlwraith, J., Gas pipe, 154.
 McKay, F. C. D., Shade fixtures, 116.
 McKay, W., Cement, 46; Inks, 172.
 McKee, J. D., Woolens, 122.
 McKee, D., Coal, 45.
 McKellar, D., Gold quartz, 44.
 McKellar Bros., Ores, gold quartz, 44.
 McKenzie, J. F., & Co., Coffee, 156; Oatmeal, 157.
 McKenzie Bros., Regalias, 175.
 McKeon, Van Hagan, & Co., Soaps, 108.
 McKesson & Robbins, Drugs, 107.
 McKinley & Co., Chairs, 113.
 McLaughlin, B. D., Desk, 173.
 McLean, G. C., Oils, 243.
 McLennan, J., Gypsum, 47.
 McLintock, J., & Sons, Quilts, 147.
 McLure, D., Inks, 172.
 McMann, G. N., Clay, 47.
 McMillan, J. A., Blank books, 176.
 McNair, A., Peas, 156.
 McNally, William G., Stone carving, 17.
 McNeil, Irving, & Rich, Paper, 131.
 McQuarrie, J., Sandstones, 46.
 McQueen, W., Coal, 45.
 McTear & Co., Felt, 146.
 McPherson, T., Bagging, 154.
 McPherson, T., & Co., Jute, 157.
 McVean, J., Wool, 158.
 McVicar, G., Amethyst, 45.
 Mechanics' Institute, Coal, 44.
 Mechanics' Mills, Cottons, 120.
 Media, B., Colored calico, 218.
 Medina, L. R., Whetstone, 101.
 Meeker, D. M., Castings, 138.
 Meeus, M. & J., Sulphur, 201.
 Megargee Bros., Paper, 130.
 Mehr, G., Dials, 262.
 Meidel, F., Safes, 209.
 Meier, J. C., 188.
 Meilleur & Co., Refrigerators, 173.
 Meissner, C. F., & Son, Papers, 191.
 Melbourne Glass Bottle Works, 153.
 Melbourne Meat Preserving Co., 157.
 Méliès, L. S., Boots, 184.
 Melillo, G., Jewelry, 219.
 Melissari, G., Essences, 218.
 Mellin, G., Food, 149.
 Mellon, F., Wines, 157.
 Mellor & Rittenhouse, Licorice, 107.

- Melville, J., Rum, 171.
 Mendheim, G., Plans, 180.
 Mendoza, Prov. Commission, Minerals, 99.
 Mendoza, Province of, Mat, 246; Fruit stands, 246; Herbarium, 249, 260.
 Menici, A., Shower bath, 218.
 Menzel, W. E., Garnets, 195.
 Mercer, T., Salt, 171.
 Mercer Pottery Co., 112.
 Merchants Salt Co., 47, 171.
 Merchants Shot Tower Co., 132.
 Merchants Manufacturing Co., Cottons, 120.
 Meriden Britannia Co., 116.
 Meriden Cutlery Co., 136.
 Meriden Silver Plate Co., 116.
 Meriden Woolen Co., 122.
 Merille, Adams H., Slate, 17.
 Merino, Instruments, 245.
 Merlini, Alfonso, & Enrico Bros., Olive oil, 217.
 Merino, Baron Vincenzo, Olive oil, 217.
 Merkelbach & Wick, Clay goods, 188.
 Mérouze, Mrs., Lace, 184.
 Mérouze, U., Laces, 184.
 Merrill & Flint, Ochre, 172.
 Merrimac Mills, Prints, 121.
 Merriman, J., Crayfish, 168; Preserves, 169.
 Mersereau, W. T. & I., Stair rods, 137.
 Merve, J. H. von der, Grapes, 163.
 Mervine, S. P., jr., Gynecological appa., 133.
 Merwin, Hulbert, & Co., Fire arms, 132.
 Metacomet Mills, Cottons, 120.
 Metal Beaters' Union, 188.
 Metallic Plane Co., 135.
 Metcalf, J., Clay 47; Bricks, 172.
 Metcalf, Theo., & Co., Chemicals, 108.
 Methuen, Mills, Bagging, 120.
 Mette, J., Daggers, 215.
 Metz, F., 188.
 Metzler, A., Minerals, 99.
 Metzner, B., Laces, 195.
 Mestre, A., Corking apparatus, 181.
 Mennier & Co., Table covers, 182; Curtains, 181.
 Meyer, C., & Sons, Piano fortes, 264.
 Meyer, F. W., Gun, 176.
 Meyer, Jas., jr., Disinfectants, 108.
 Meyer, H. D., Ivory, 191.
 Meyer & Co., Silks, 219.
 Meyer & Henckel, Varnishes, 209.
 Meyer-Waespi & Co., Undergarments, 209.
 Meyers, S., & Son, Screws, 177.
 Meyenberg, S. M., Silks, 125.
 Meyr's Nephew, A., Glassware, 193.
 Mez, C., & Son, Sewing silks, 190.
 Miasake, R., Bamboo work, 239.
 Michaelis, F., Vinegar, 230.
 Michaelis & Kaskel, Shirts, 125.
 Michel, L., Decorations, 181.
 Michel, P., Medicines, 179.
 Michelsen, J. B., Cutlery, 215.
 Michigan, State of, School system, 258.
 Micka, K., Stoves, 194.
 Middleboro' Shovel Co., 135.
 Middlesex Co., Woolens, 122.
 Middleton & Thatcher, Burglar alarms, 263.
 Middletown Tool Co., 138.
 Middletown Plate Co., 116.
 Midgley, Mrs., Wool flowers, 151.
 Midnight Yarn Co., 121.
 Miedel, D., Ventilator, 202.
 Migliaccio, R., Paper, 220.
 Miles, Bros., & Co., Brushes, 139.
 Miliani, C. F., Crockery, 218.
 Millias, Gimps, 184.
 Miller, D. K., Locks, 138.
 Miller, E., & Co., Oils, 109; Lamps, 117.
 Miller, E., Hardware, 138.
 Miller, H. F., Piano fortes, 264.
 Miller, J., & Co., Cut glass, 144.
 Miller, J. S., Trusses, 134.
 Miller, J., Ropes, 154.
 Miller, S., Umbrellas, 127.
 Miller, W. D., Fire arms, 132.
 Miller, W. P., & Co., Lubricants, 109.
 Miller, Hugh, & Co., Medicine, 176.
 Miller, Knight, & Co., Hats, 126.
 Miller & Krips, Bronze, 137.
 Miller, Metcalf, & Parkins, Steel, 19.
 Miller Bro., Cutlery Co., 136.
 Miller's Bible & Pub. House, Bibles, 261.
 Miller's Falls Co., Tools, 136.
 Mills, J. D., Birds, 243.
 Millet, J. G., Graphite, 47.
 Millerstown Iron Co., 15, 20.
 Milliani, P. F., Paper, 220.
 Millichamp, William, Show cases, 173.
 Million & Servier, Silks, 183.
 Million, Guet, & Co., Carriages, 187.
 Mills, E., & Co., Tools, 135.
 Mills, M. A., Inks, 205.
 Mills & Hutchinson, Tweeds, 174.
 Millville Mfg. Co., Cottons, 120.
 Millward, H., & Sons, Needles, 147.
 Milner & Hunt, Stone, 47.
 Milner, W., & Sons, Silks, 146.
 Milton Furnace & Coal Co. 16; 22.
 Minas-Geraes, Province of, Diamonds, 97; Quartz, 97; Cotton fabrics, 244.
 Miner, Jacob G., Street lamps, 117.
 Mineral Water Direction, 66.
 Mineral Water Stock Co., 84.
 Mineur, C. G., Wall paper, 213.
 Mingori, V., Olive oil, 216.
 Ministry of Public Instruction, Statistics, 225; Maps, 225.
 Minot, Hooper, & Co., Cottons, 118.
 Mintaner & Bermudez, Shirts, 248.
 Minton, Hollins, & Co., Tiles, 143.
 Minton's China Works, 143.
 Missenharter, C., Musical instruments, 265.
 Mission Woolen Mills, Blankets, 123.
 Mississippi Mills, Cottons, 120; Woolens, 122.
 Mita, C., Bronzes, 238.
 Mitchell, G. E., Cologne, 111; Plasters, 133; Grindstones, 136.
 Mitchell, H. L., Coal, 45.
 Mitchell, S. A., Atlases, 257.
 Mitchell, William H., Granite, 17.
 Mitchell, Wilson, Stone, 18.
 Mitchell & Rummelsburg Furniture Co., 113.
 Mitchell, Vance, & Co., Gas fixtures, 117; Bronzes, 128; Clocks, 262.
 Mix, G. J., & Co., Britannia ware, 116.
 Miyagawa, F., Porcelain and Faience, 237.
 Mobeogs Machine Co., Range, 212.
 Mochan, A., Clay, 47; Bricks, 172.
 Mockridge, E., & Co., Azumea, 107.
 Model of Transport Wagon, 230.
 Modie, D., Shells, 168.
 Moeller, A., Upright piano, 264.
 Moeller, P. W., Blackboard frame, 257.
 Moeslin, J., Pearl buttons, 196.
 Moestue, Th., & Co., Slate, 88; Books, 215; Safe, 215.
 Mohammed, Tawfic Pasha, 223.
 Moiraghi, Shoes, 219.
 Moisant, A., Metallic frame, 181.
 Moistic Iron Works, 48.
 Moitrier, L., Baskets, 187.
 Mokoto, Fukui, 236.
 Molfini, L., Stone, 94.
 Molma & Carranza, Metals, 101.
 Molinari, J., Arm chair, 246.
 Mall, T., Utensils, 202.
 Möller, C., Waterproof, 209.
 Möller, P., Oil, 214.
 Monadnuck Mills, Quilts, 119.
 Moncrieff, J., Wheat, 156.
 Mondron, L., Glass, 202.
 Monitor Furnace Co., Iron ores; Iron, 21.
 Monk, D. J., Vinegars, 152.
 Monnoyer, J., & Sons, Glass, 202.
 Monroe Furnace, Iron ores; Iron, 22.
 Montagnac, E. de, & Son, Velvet, 182.
 Montagnon, A., Faience, 180.
 Montala Mekaniska Stock Co., Iron, 85.
 Monteiro & Co., Inks, 243.

- Montel, L. & S., Camphor, 198.
 Montessuy & Chomer, Crapes, 138.
 Montgomery, R. M., Stone, 18.
 Montreal Geological Survey, Bricks, 172;
 Ochres, 172.
 Montreal Plumbago Mining Co., 47, 172.
 Montreal Weaving Co., 175.
 Monument Mills, Quilts, 119.
 Mook, J. P., Kali cream, 192.
 Moonta, Wallaroo, Mines, Ores, 161.
 Moore, C., Woods, 151; Seeds, 151; Pre-
 serves, 152; Fibres, 152.
 Moore, C. F., Jewelry, 233; Porcelain, 233;
 Carved figures, 234; Enamel ware, 234.
 Moore, D., & Co., Clay, 47; Bias cutter, 125;
 Bricks, 172; Tinware, 173; Stoves, 173.
 Moore, L., Shirts and hats, 124.
 Moore, T., Handles, 176.
 Moore, Th., Models, 175.
 Moore & Co., Wool, 158.
 Moore, York, & Howell, Furniture, 113.
 Moorhead Clay Works, 111.
 Moorehead & Co., Iron, 20.
 Moorehouse, C. L., & Son, Oils, 109.
 Mora, D., Chestnut extract for dye, 217.
 Morandi, G. M., Dress, 219.
 Morandi, P., Ink, 217.
 Moravia, Nails, screws, 198.
 Morel, A., Bronzes, 181; Ornaments, 186;
 Glass, 202.
 Morel, C., & Sons, Skein silks, 124.
 Morell, S. O., & Co., Equipments, 212; Sword,
 213.
 Morewood, E., & Co., Tin plates, 30.
 Morgan & Headley, Jewelry, 127.
 Morgan, Malloy, & Malcolm, Phæton, 177.
 Morgan's, Enoch, Sons, Sapolio, 108.
 Mori, Kabe, & Co., Porcelains, 239.
 Morita, B., Silk, 237.
 Morley, Tools, 176.
 Morley, J. & R., Hosiery, 147.
 Morreale, E., Liquors, 220.
 Morren & Robb, Harness, 178.
 Morris, E., & Co., Hats, 126.
 Morris, J., Augers, 176.
 Morris, T., Saddle, 165.
 Morris, W. B., Brushes, 177.
 Morris, Tasker, & Co., Iron work, 22.
 Morrison, L. K., Pumps, 155.
 Morrison, W. A., Precious stones, 45.
 Morrison, W. C., Jewelry, 175.
 Morse, G. D., & Co., Soap, 171.
 Morse, L., Settee, 115.
 Morse Bros., Plumbago, 18.
 Morse & Bennett, Steel axles, 21.
 Morson & Son, Chemicals, 141.
 Mortimer, J. R., Pneumatics, 263.
 Mottl, Sons, M., Clothing, 194.
 Morttock, J., Pottery, 143.
 Morton, J., Gold pens, 130.
 Morton, T., Sash chain, 137.
 Morton, W. S., & Co., Furniture, 144.
 Moser, Charles, & Co., Colors, 110.
 Moser, L., Glass articles, 193.
 Mosler Safe & Lock Co., 115, 138.
 Moss, G. A., Blueing, 110.
 Moss Manufacturing Co., Shirtings, 120.
 Moss & Co., Stationery, 130.
 Mossop & Garland, Barks, leather, 168.
 Mostardini, A., Perfumery, 218.
 Motala Machine Co., Guns, 213.
 Mott, J. L., Iron works, 137.
 Mottett, J., & Co., Perfumeries, 180.
 Moulton, R., Work box, 167.
 Mount Holly Paper Co., 130.
 Mount Savage Furn., Iron ores, 14; Iron, 22.
 Mount Vernon Furn., Iron ores, 16; Iron, 21.
 Mount Vernon Co., Twines, 119.
 Mount Washington Glass Works, 113.
 Mount & Co., Glassware, 153.
 Moures & Co., Text books, 225.
 Moutoux, E. W., Hair devices, 128.
 Moyle, E., Cordage, 164.
 Muhlbacher, Carriages, 187.
 Muhldorf Graphite Co., 66.
 Muhr's, H., Sons, Jewelry, 127.
 Muir, J. N., Clothing, 175.
 Muirhead, R., Cigars, 151.
 Mujica, S. E., Blood albumen, 246.
 Muller, E., & Co., Tiles, 180.
 Muller, H., Glass articles, 193; Birds;
 woolen goods, 209; Wool, 210.
 Muller's Sons, Thermometers, 261.
 Muller, J., Playing cards, 200.
 Muller, P. A. E., Honey, 210.
 Muller's Sons, N., Bronze ware, 129.
 Mundy, D. L., Views, 164.
 Munger, J. W., Detergents, 109.
 Munich-Dachau Paper Mill, 191.
 Munkedals Stock Co., Paper, 213.
 Munksjo Paper Factory, Paper, 213.
 Munn, A. L., Maizena, 152.
 Munn & Cochner, Clay, 47; Bricks, 172.
 Munro, A., Wines, 152.
 Munson, David, Lightning rods, 263.
 Munzinger, C., Felt, 199.
 Murakami, T., Tinware, 237.
 Murakawa, D., Lead powder, 237.
 Murat & Co., Jewelry, 184.
 Murga, N., Coarse salt, 245.
 Muro, F., Iron, 101.
 Murphy, A. A., Stools, 173.
 Murphy, E., Ventilators, 155.
 Murphy, W. F., & Sons, Blank books, 131.
 Murphy, Simmes, & Co., Brushes, 177.
 Murray, A., Jellies, 162.
 Murray, E. W., Phosphates, 48.
 Murray, J., Wool, 163.
 Murrey Mining Co., Mica, 13.
 Muschialli, L., Pier glass, 153.
 Musical Instrument Manufacturing Co., 265.
 Muspratt, J., & Sons, Soda, 141.
 Muspratt Bros., & Huntley, Soda, 141.
 Mussen, J., Tobogan, 178.
 Mustad, O., & Son, Spikes, 215.
 Musumeei, Gulli, G., Licorice, 216.
 Muttura, J. O., Bricks, 220.
 Muzet & Co., Hair work, 185.
 Myburgh, N., Wheat, 168.
 Myer, Joseph, Damask table-covers, 190.
 Myer Bros., Gloves, 194; Bolting cloth, 200.
 Myers, A. J., Minerals, 15.
 Myers, J., Turned work, 174.
 Myers, S. S., Stove polish, 110.
 Myring, J., Malt, Barley, 156.
 Nabika, S., Brushes, 238.
 Nachtmann, J., Aquariums, 198.
 Nacken, G. H., Cottons, 189.
 Naesman, A. E., Metal work, 212.
 Naesman, E. A., Halters and locks, 214.
 Nagle, Cook, & Ewing, Paper hangings, 132.
 Nagata, G., Instruments, 239.
 Nagayama, S., Weights, 239.
 Nagura, O., Sea weed, 238.
 Nairn, D., Sauce, 165.
 Nairn, M., & Co., Oil cloths, 146.
 Nakagawa, Y., Tachimoto, I., Silk, 237.
 Nakashima, R., Porcelain, 237.
 Nakatsuji, T., Silk thread, 238.
 Nakaye, G., Katta, & Co., Crape, 238.
 Namei, G., Metallic goods, 220.
 Nara, G., White silk, 239.
 Narragansett Mills, Cottons, 120.
 Nash, Henry, & Co., Tin plates, 30.
 Nash & Jackson, Carriage, 177.
 Nashawannuck Manuf. Co., Suspenders, 125.
 Nashua Card and Glazed Paper Co., 131.
 Nashua Manufacturing Co., Cottons, 119.
 Nass, H. S., Boots, 215.
 Natanson & Hurwitz, Felt shoes, 190.
 National Button Co., 128.
 National Fire Alarm Telegraph Co., 263.
 National Museum, Skeletons, 40.
 National Museum at Washington, 164; Birds,
 165.
 National Museum, Egypt, swords, stationery,
 dress goods, silks, carpets, flannels, mar-
 ble, gold, chemicals, tiles, silver ware, tex-

- tile fabrics, 224 : Pearls, plants, crocodiles, cereals, gums, woods, lamps, ornaments, photographs, text-books, ethnography, window patterns, vases, plaster casts, gold coin, maps, musical instruments, water bottles, paintings, 225 ; Textile fabrics, ivory, 226.
- National Surgical Institute, 133.
- National Suspender Co., 125.
- National Temperance Society, 260.
- National Wood Mfg. Co., Wood carpets, 117.
- Naples, Mineralogical Society of, Sulphurous products, 216.
- Natives of Hawaii, Kapa, 242.
- Natte, Jewelry, 244.
- Naumann, J., Pearl buttons, 196.
- Naumann-Burkhardt, H., Honey, 201.
- Naumkeag Mfg. Co., Cottons, 119.
- Navassa Phosphate Co., 19.
- Nax, Kuhne, & Silberman, Pipes, 128.
- Neal, J., Jewelry, 147 ; Cutlery, 149.
- Neall, D. W., Porcelain teeth, 134.
- Nedwied & Son, Chalk, 66.
- Needham, J. & G. H., Guns, 148.
- Neff, J., String instruments, 264.
- Negishi, N., Bedsteads, 239.
- Neher, C., Jewelry, 127.
- Neilson, Storer, & Sons, Yarns, 145.
- Neindeifel, J., Pearl buttons, 196.
- Neidham, J., Cutlery, 149.
- Nekervis, W., Parrott gun, 132.
- Nell, F., Gold, 101.
- Nelson Bros., Wheat, 151 ; Flour, 152.
- Nelson, C. L., Paper bags, 176.
- Nelson, H. A., & Sons, Brooms, 177.
- Nelson Committee, Ores, coal, marble, 40.
- Nelson, Mather, & Co., Chamber suits, 114.
- Nemoz, P., Felt hats, 184.
- Nerad, J., Clothing, 194.
- Nes, C. M., & Montzer, S. J., Steel, 21.
- Nestle, H., Milk food, 201.
- Netto, Cordage, 245.
- Neuber, R., Bronze goods, 196 ; Bronze articles, 197.
- Neubert, C. E., Chemicals, 187.
- Neuchatel Asphalte Co., 70.
- Neukumet, P., Fire bricks, 111.
- Neufeldt, A. A., Utensils, 189.
- Neuhusen, J., Billiards, 188.
- Neuman, R., & Co., Bag frames, 138.
- Neumann Bros., Guns, 204.
- Neuvialle, J. B., Heating apparatus, 181.
- Nevins Mill, Bagging, 120.
- Newark Crayon Co., 130.
- Newichawanick Co., Blankets, 140.
- Newberry, R., Teeth, 250.
- New Britain Lock Co., 138.
- New Castle Chemical Works Co., 141.
- New England Co., Cassimeres, 121.
- New England Bunting Co., 139.
- New England Glass Company, 112.
- New Haven Clock Company, 262.
- New Haven Organ Company, 265.
- New Hampshire, State of, Instruction, 258.
- New Jersey, State of, Fertilizers and wood, 267 ; School system, 260.
- New York Silicate Book Slate Company, 257.
- Nims, H. B., & Co., Globes, 257.
- North Am. Young Men's Christian Asso., 266.
- New Marble Works Stock Company, 84.
- New River R.R., Mining, and Mfg. Co., 13.
- New South Wales Commissioners, Candles, 150 ; Shawls, 151.
- New South Wales Co., Sugars, 152.
- New South Wales Shale and Oil Co., 150.
- New Telegraph Company, Quartz, 161.
- New York Folding Table Company, 113.
- New York Knife Company, 136.
- New York Leather Manufacturing Co., 121.
- New Zealand, Gov. of, Gold specimens, 40 ; Fabrics, 163, 164.
- New Zealand Commissioners, Quartz, 40.
- New Zealand Prov. and Prod. Co., 165.
- Newman, Geo. C., Gilt frames, 116.
- Newton, Jotham, Coal dust fuel, 16.
- Newton, J., Paints, 172.
- Newlin & Yardley, Shovels, 135.
- Niantic Woolen Mills, 122.
- Nicaise, C., Bolts, 204.
- Nicaise, P. & N., Bolts, 204.
- Nicholson, H., Playing balls, 148.
- Nicholls, R., Church organ, 264.
- Nickle, R., Toys, 127.
- Nieuwenhuizen & Van Stratum, Towels, 205.
- Nightingale, Thomas, Tiles, 172.
- Nimikawa, S., Bronzes, 238.
- Nishikori, K., Omi crape, 239.
- Nishimura, T., Wood work, 239.
- Nishimura, S., Embroideries, 238 ; Wood work, 239.
- Nishimura, G., Crape, 238.
- Nitedals Match Factory, 214.
- Nitscke, W., Curiosities, 161.
- Nitschke, W., Cordials, 163.
- Noa, T., Pasteboard articles, 197.
- Noble, T., Photographs, 155.
- Nobori, Asahi, 236.
- Nobuakira, Yamataka, 236.
- Nock, G. W., Locks, 137.
- Noel-Winderling Bros., Dental anatomy, 220.
- Nokii, T., Rugs, 239.
- Nolan, L. Stoneware, 153.
- Nolte, E., Tooth powder, 246.
- Nomura, K., Silk, 237.
- Nonenberger, C., Hatters' tools, 126.
- Nonotuck Silk Co., 124.
- Nord & Son, Refrigerator, 215.
- Nordahl, P. N., Boots, 217.
- Nordenskiöld, A. E., Meteorite, 84.
- Noriami, Lokoami, Hayashiami, Mochiami, & Co., Fans, 238.
- Noritachi, Kawara, 236.
- Nordström, M. S., Stamps, 213.
- Norfolk and New Brunswick Hosiery Co., 125.
- Normand, J., & Sons, Linens, 145.
- Normann, J. G., Moulds, 189.
- Northfield Knife Co., 136.
- North-eastern Pastoral Society, Wheat, 156.
- N. W. Arm Rolling Mill Co., 177.
- North-western Tower Clock Co., Clock, 262.
- North Yelta Mine, Ores, 161.
- Nörr, E., Mines, 60, 188.
- Norrköpings Match Mfg. Co., 211.
- Norrmann, J., Toys, 191.
- Norrström, A., Knives, 213.
- Norriss & Co., Silks, 147.
- Northampton Furnace, Iron Ores, 15 ; Iron, 20.
- Northrup, W. S. & M. S., Gloves, 126.
- Norton Iron Works, 15, 22.
- Norwalk Lock Co., 138.
- Norway Plains Co., Blankets and flannels, 122.
- Norwich Woolen Co., 122.
- Nose, G., Embroidery silk, 238.
- Nothing & Soupert, Rose trees, 230.
- Nottingham Lace Works, 124.
- Nova Scotia Advisory Board, Gypsum, 47.
- Novelty Manufacturing Co., Trimmings, 128.
- N—— N——, Extracts and perfumery, 243.
- Nuchterlein, F., Colors, 188.
- Nunes, R., Rum, 171.
- Nuremberg Ultramarine Factory, 187.
- Nya File Manufactory, Files, 213.
- Nydalens Company, Cotton, 215.
- Nye, William F., Oils, 109.
- Oahu College, Shells, 242.
- Oakden, J. J., Coal, 40.
- Oakey, John, & Sons, Emery, 29.
- Oakley, W. H., jr., Carpet warp, 118.
- Oberg, C. O., & Co., Files, 213.
- Obanawa, Shimanchi, Idzumi, Watanabe, & Co., Designs for fans, 238.
- Obershaus, J., Pearl buttons, 196.
- Ocean Mills, Cottons, 119.
- Odell, O. S., Paper boxes, 176.
- Odhner & Co., Ranges, 212.
- Odense Match Factory, 209.
- Odin Distillery, Liquors, 210.

- Oechelhäuser, Cottons, 189.
 Oehme, J. D., & Sons, Toys, 191.
 Oelkers, J. B., Ivory and bone goods, 128.
 Oetiker, M. R., Bed covers, 199.
 Offergeld Bros., Paints, 201.
 Oglesby, Moore, & Co., Paper, 131.
 O'Hara, C. M., Chairs, 113.
 Ohio, Archæological Association of, Indian Relics, 261.
 Ohio Coal Co., 15.
 Ohio Furnace, Iron ores, 14; Iron, 21.
 Ohio Marble Co., 17.
 Ohio River Salt Co., 107.
 Ohio Stone Co., Stone, 18.
 Ohio Tool Co., 135.
 Ohio, State of, Educational, 258.
 Ohio Valley Piano Co., 264.
 Oil Cloth Factory, Sand, 47.
 Okatani, Shibata, & Co., Faience, 238.
 O'Keefe, A., Wheat, 156.
 Okuba, K., & Takenouchi, R., Tobacco, 238.
 Oldach & Morgenthaler, Bookbindings, 131.
 Oleophene Oil Co., 109.
 Olive Furnace, Iron ores, 14; Iron, 21.
 Oliveira & Bro., Soap, 243.
 Oliver, G., Ores, 44.
 Olivier, J. J., & Sons, Cloth, 203.
 Olivieri, L., Fancy articles, 219; Hardware, 220.
 Ollive, A., Pavements, 180.
 Olmos, J. V., Minerals, 99.
 Olsen, Th., Ornaments, 215.
 O'Malley, E., Safety cage, 155.
 Onderwater, H. F., Stones, 79.
 Oneto, A., & Co., Soap, 216.
 Ono, G., Osaka sails, 239.
 Onondaga Pottery Co., 112.
 Onsy, Type, 225.
 Ontario Advisory Board, Orcs, 44.
 Ontario Lithographic Stone Co., 47.
 Ontario Plaster Co., 47.
 Ophir Furnace Co., Iron Ores, 15; Iron, 22.
 Opitz, C., & Son, Paper, 197.
 Oppenheimer Bros., Gold nugget, 44.
 Opsahl, P. J., Safes, 215.
 Orange Free State, Ostrich feathers and eggs, tusks of ivory, springbuck mats, tanned skins, shambucks, stuffed birds, hide thongs, etc., 230.
 Orange Furnace, Iron ores, 14.
 Orange Iron Co., 22.
 Orange Judd & Co., Building blocks, 128; Am. Agriculturist, 260.
 Ortnier & Houle, Engraving, 148.
 Osborn, B., Paper boxes, 131.
 Osborn Mills, Cottons, 120.
 Osgood, J. R., Books, 261.
 Oshaki, I., Silk braid, 238.
 Osterberg, C. G., Furniture, 212.
 Osterby & Strömbacka, Ores, 84.
 Ostermalk, C., Lime, 97.
 Osterritter, J., Fans, 197.
 Osterritter, S., Leather articles, 197.
 Otamendi, C., Shells, 101.
 Otis Co., Denims, 119; Hosiery, 126.
 Otis Iron and Steel Co., 19.
 Oto, M., Cabinet work, 237.
 Ott, G., Toys, 191.
 Ott & Co., Silver ware, 190.
 Ott & Brewer, Granite ware, 112.
 Ottaviani Bros., Essences, 217.
 Ottawa Iron and Steel Co., 45.
 Ottawa Iron and Steel Mfg. Co., 48.
 Ottenheimer & Sons, Corsets, 100.
 Otterelvans Paper Mills, 215.
 Otto, F. G., & Sons, Surgical instr., 134.
 Otto, J. W., Piano, 264.
 Ougheltree, G., Bag frames, 138.
 Ovre, Mrs., Flowers, 209.
 Owen, Fritz Cunliffe, 236.
 Owen Paper Co., 130.
 Oxford Woolen Mills, 174.
 Paarl Wine & Brandy Co., 168.
 Pabst, D., Sideboard, 114.
 Pabst, G. J., Toys, 191.
 Pacchiani, E. P., Olive oil, 217.
 Page, Kidder, & Fletcher, Coal tar, 108.
 Pagliaccetti, R., Statues in baked clay, 218.
 Pagliaro, A. M., Gelatines, 220.
 Painchand. C. F., Plasters and plaster machine, 176.
 Paine's Furniture Manufactory, 115.
 Paine, Schering, & Glatz, Oils, 110.
 Palmcrantz, H., Mitrailleuse, 213.
 Palm, C., & Co., Ornaments, 127.
 Palme, Son, F. E., Glassware, 193.
 Palme, E., Lustre, 192.
 Palmer Mills, Dress goods, 119.
 Palmer, B. F., Artificial limbs, 134.
 Palmer, T. J., Chairs, 114.
 Palmer, W. F., Tools, 145.
 Palmer & Kendall, Mosquito nettings, 127.
 Palmer & Williams, Corsets, 125.
 Pallu, E., & Co., Coconut fibres, 182.
 Panier, E., Mathematical instruments, 185.
 Paoli Belt Company, Electrics, 263.
 Pape Bros. & Kügeman, Frames, 116.
 Papini, L., Truss, 220.
 Para, Province of, Oils, 243; Netting, 244.
 Parana, Benevolent Society of, Distaff, 247; Embroideries, 249.
 Parana, Com. General of, Tiles and bricks, 243.
 Parana, Commission of, Stone, 100; Shelves, 244.
 Parana, Province of, Stone, 97; Candles and soap, 243; Articles, 244.
 Parapara Iron and Coal Company, 40.
 Pardee, A., & Co., Coal, 16.
 Parfonry & Lemaire, Marble, 180.
 Paris, I. J., Iron, 74.
 Parisc, A., Sons, Lock, 220.
 Park Bros. & Co., Steel, 19.
 Parker, C., Shot guns, 133.
 Parker, J., Son, & Co., Paper, 130.
 Parkhurst, V. P., Candle stand, 117.
 Parkhurst & Gridley, Shawl straps, 129; Stationery, 130.
 Parkin, W. W., 232.
 Parkinson Bros., Baking powder, 141.
 Parks, W., & Co., Cotton yarns, 174.
 Parma, Joseph, Piques, 194.
 Parmentier, Gosset, & Co., Marbles, 220.
 Parmentier, Van Hoegarden, & Co., Fabrics, 202.
 Paroni, A., Cement, 100.
 Parvis, Furniture, 224.
 Parsons, J. H., & Co., Underwear, 126.
 Parsons Paper Co., 130.
 Parsons, J., Glove powder and inks, 110.
 Partridge & Co., Gas fixtures, 145.
 Parnell, M., Wines, 152.
 Pas, G., Utensils, 202.
 Passaic Rolling Mill Co., Iron, 21.
 Passaic Zinc Co., 13, 23.
 Pascal Iron Works, 22.
 Pastore, G., Juice of licorice, 216.
 Patagones, Justice of the Peace of, Salt, 245.
 Pateguazza Bros., N. & A., Perfumery, 217.
 Patent Plumbago Crucible Co., 143.
 Patent Nut and Bolt Co., 149.
 Patent Selenitic Cement Co., 29.
 Paton Manufacturing Co., Cloths, 174.
 Patrick & Carter, Electrics, 263.
 Paton, R., & Son, Settees, 114.
 Patrick, H. W., Porcelain, 149.
 Patron, Bros., Waters, 101.
 Patten, F. H., Quartz, 19.
 Patterson Bros., Marble tablets, 155.
 Patury, jr., Glass ware, 244.
 Paul, John, & Co., Sand and stone, 18.
 Pauli, F., Perfumery, 211.
 Paulus, E., Watches and clocks, 262.
 Pauly, Bouthon, & Co., Vinegar, 230.
 Pausacker, Evans, & Co., Portmanteau, 154.
 Pautrepant Estate, Lace bark, 170.
 Pauw, F. de, Trimmings, 184.
 Pawtucket Hair Cloth Co., 123.
 Paxson, Comfort, & Co., Burial robes, 139.

- Payette, Adolph, Axle, 178.
 Payne, G., Arrowroot, 152.
 Peabody Mills, Cottons, 119.
 Peach Bottom Slate Mining Co., 17.
 Peace Dale Mfg. Co., Woolens, 122.
 Peacock, H. H., Fancy cases, 129.
 Peacock, W., Cricket balls, 177.
 Peake, T., Bricks, 142.
 Peirce, I., School furniture, 257.
 Pears, A. & F., Soap, 141.
 Pearce Bros., Hides, 156.
 Pearson, T., & Sons, Quilts, 145.
 Pearsons, G. W., Standpipe, 265.
 Pease, F. S., Oils, 108.
 Pease, J., Boot uppers, 175.
 Peck & Greene, Underwear, 126.
 Peck & Snyder, Skates, 136.
 Peckham Mfg. Co., Jeans, 118; Woolens, 123.
 Pecora Paint Co., 109.
 Peden, M. J., Maize, 151.
 Pedruncini, J., Lime, 100; Bricks, 246.
 Peel, T. W., Clay, 47; Bricks, 172.
 Peine, E., Buttons, 191.
 Pell, A. J., Frames, 173.
 Pellas, G., Galvano-plastic ornaments, 218.
 Pellet, A. P., Raw silk, 182.
 Pelletier, M. A., & Sons, Glass, 180; Stained glass, 181.
 Peloubet, Pelton, & Co., Reed organs, 264.
 Pelt, J. & J., Robes, 178.
 Peltier & Paillard, Preserve boxes, 181.
 Peltzer & Son, Thread and cloth, 203.
 Penal Department, Melbourne, Leather, 156.
 Peñalva, B., Horse belt, 250.
 Penerty, E. F., & Co., Axles, 178.
 Penfield, E. C., & Co., Trusses, 133.
 Penna, Arango, Medicines, 243.
 Penn Gas Coal Co., 16.
 Penn Steel and Iron Co., 15, 19.
 Pennise, Baron di Floristallo, Sulphur, 74; Essence, 218.
 Pennsylvania Furnace, Iron ores, 14; Iron, 22.
 Pennsylvania Lead Co., 23.
 Pennsylvania Marble Co., 17.
 Pennsylvania Salt Manufacturing Co., 107.
 Pennsylvania, State of, Educational, 260.
 Penrose & Richards, Coke fuel, 29.
 Pensel, H., & Co., Slates, 191.
 Penton, T., Cooking engine, 174.
 Penyrorsed Slate Quarry, 29.
 Perard, V., Sheep-shearer, 186.
 Percussion Caps Cartridge Factory, Percussion caps, 198.
 Percy, J., Horse shoes, 178.
 Perez, A. G., Tonic, 245.
 Perkins, A. M., & Son, Oven, 145.
 Perks, S., Extracts, 142.
 Perl, J., Teeth, 198.
 Perley, Miss H. A., Lace, 175.
 Perrault, L., & Co., Blank books, 176.
 Perreaux, Velocipede, 187.
 Perreaux, L. G., Model, 182.
 Peretti, S., Stone, 100.
 Perez, L., Waters, 101.
 Perrin Bros., Kid gloves, 184.
 Perrin, W. J., Malt, 156.
 Perrot, A., Melodeon, 265.
 Perrot, H., Bronzes, 186.
 Perry, J. R., Organs, 265.
 Perry, V., Bandages, 133.
 Perry, Mrs., Necklaces, 167.
 Perry, Davis, & Co., Gratings, 155.
 Perry, Hunter, & Co., Fuse, 153.
 Peter, W. S., Wool, 165.
 Peters, H. S., Sandstones, 46.
 Peters, S., Sashes, 174.
 Peters, T., & Sons, Carriages, 150.
 Peterson, T. B., & Bros., Books, 260.
 Pettit, H., Bridges, 265.
 Petit-Pierre & Bryson, Jewelry, 200.
 Pettit & Wilson, Exhibition buildings, 265.
 Petrie & Howie, Ornamenting, 173.
 Petroli, P., Shoes, 219.
 Petterson, A., Hairdresses, 215.
 Petterson, C. E., Table, 212; Embroidery, 213.
 Petterson, G., Valises, 215.
 Petterson, K., Granite, 88.
 Pettingill & Sawyer, Waterproofs, 126.
 Pepper, G., Ventilators, 155.
 Pepperill Manufacturing Co., Cottons, 119.
 Pewzer, J., Timber, 151.
 Peyton & Peyton, Bedsteads, 144.
 Pfaff, J., Clarionets, 264.
 Pfeiffer, C., Design, 267.
 Pfizer, Charles, & Co., Drugs, 108.
 Pharmaceutical Preparations Comp., Pharmaceuticals, 243.
 Phelps, Doremus, & Corbett, Chairs, 113.
 Philadelphia Architectural Iron Co., 139.
 Philadelphia Galvanizing Co., 139.
 Philadelphia Iron and Steel Co., 20.
 Philadelphia Quartz Co., 107.
 Philadelphia and Reading Coal and Iron Co., 15, 16.
 Philadelphia and Reading R. R., Stone, 18; Rails, 21; Cereals, 267.
 Phila. Worsted Spinners' Association, 121.
 Philadelphia Truss Co., 134.
 Philippe, C., Cloth, 182.
 Phillippe, E., Jewelry, 184.
 Phillips, Eugene F., Telegraph wires, 263.
 Phillips, C. C., & Co., Varnishes, 110.
 Phillips & Jacobs, Chemicals, 108.
 Phillips, Nimick, & Co., Iron, 19.
 Phipson, Miss E., Furniture, 144.
 Phoenix Foundry Co., 155.
 Phoenix Furniture Co., 114.
 Phoenix Lock Works, 138.
 Phoenix Manufacturing Co., Crucibles, 18.
 Phoenix Match Manufacturing Co., 211.
 Phosphor Bronze Co., 30, 149.
 Piacente, F., Olive oil, 217.
 Pichler, H., Linens, 189.
 Pichot, E., Labels, 187.
 Piel, A., Jewelry, 184.
 Pierce, G. G., Cheese, 156.
 Pierce, C. W. & I., Felts, 122.
 Pierce, I. N., Paints, 110.
 Pierson & Herman, Hatters' tools, 126.
 Piette, P., Paper, 197.
 Pigon, Wilks, & Laurence, Gunpowder, 142.
 Pike, William J., Clays, 29.
 Pilat, A., Gloves, 194.
 Pile, W. H., & Sons, Hydrometers, 112.
 Pilling, G. P., Society jewels, 127; Surgical instruments, 133.
 Pillow, Hershey, & Co., Tacks, 177.
 Pim Bros., Poplins, 146.
 Pine Grove Furnace Co., Iron ores, 14; Iron, 21.
 Piñero, A., Soap, 246.
 Pinet, F., Boots, 184.
 Pingree, L. F., Artificial limbs, 134.
 Pinon & Guérin, Cloth, 182.
 Pinson, Fancy articles, 185.
 Piqua Woolen Mills, 122, 125.
 Piqueè, F., & Bros., Velvets, 182.
 Pirie, A., & Sons, Paper, 148.
 Pirrone, A., Licorice, 216.
 Piton, C., Trophies, 139.
 Pitet, sr. and jr., Brushes, 187.
 Pitton & Co., Sandstones, 46.
 Pittsburg Steel Casting Co., 20.
 Plank, E., Toys, 191.
 Planteijdt, L., Canvas, 205.
 Plateau, E., Inks, 180; Stationery, 185.
 Platt Bros. & Co., Buttons, 129.
 Plauche, E., Ink, 201.
 Plauche, M., Ink, 201.
 Plate Glass Mfg. Joint Stock Co., 202.
 Pleuer & Co., Silver ware, 190.
 Plice, W. W., Lantern, 173.
 Plimpton Mfg. Co., Paper, 130.
 Plumber, B., Copper pyrites, 44.
 Plumber, McIntyre, & Russ, Ores, 44.
 Plummer, G. W., & Co., School furni., 129.
 Poblete, T., Medicinals, 250.
 Podany, F., & Mathias, Cabinet articles, 193.

- Pohl, C., Wines, 157.
 Poirer & Son, Soap, 179.
 Poirrier, A., Chemicals, 180.
 Poirrier-Mortier & Muller, Dyed fabrics, 182.
 Poissonnietz, J. B., Cases, 204.
 Pokorny, K., Gloves, 194.
 Polaczek, A., Pearl buttons, 197.
 Policard, R., Flower stands, 187.
 Polidori, Count Augusto, Prepared green weed, 218.
 Politzer, J., Costumes, 124.
 Pollak, J., Oils, 193; Ether, 198.
 Pollak's Son & Co., Carpets, 194.
 Pollock, S., Horse checks.
 Polson, A., Cereals, 156.
 Polychroite Veneer Co., 110.
 Ponce, D., Table cloth, 247.
 Poncet, sr. & jr., Silks, 183.
 Ponemah Mills, Cottons, 118.
 Ponsard & Gigli, Iron, 94.
 Ponti, Rovera, & Co., 219.
 Pontif Oleographic Society, Frames, 218.
 Pontoosuc Woolen Manufacturing Co., 122.
 Ponzoni, L., Medicines, 220.
 Pool & Kamstra, Skates.
 Poole, H. & S., Ores, 45.
 Poolman, J., Table, 115.
 Povat, S. S., Ammonium, 171.
 Pope Manufacturing Co., Air pistols, 127.
 Pope, Cole, & Co., Copper, 23.
 Poplar Creek Mineral R. R. Co., 15.
 Poron Bros., Millinery, 183.
 Port, A., Skins, 198.
 Port Henry Iron Ore Co., 13.
 Porta, F., Stone, 99.
 Pork Packing Co., 210.
 Port, A., Leather gloves, 195.
 Porter & Bainbridge, Stationery, 131.
 Porter & Coates, Books, 260.
 Portland Stone Ware Co., 111.
 Postawka, L., & Co., Taboret, 114.
 Pottecher, B., Curry comb, 186.
 Potter, J. E., & Co., Bibles, 260.
 Potter, T., Sons, & Co., Oil cloths, 121.
 Potter, W. K., Jewelry, 127.
 Potter, Ainsworth, & Co., Books, 260.
 Pottier, Enamels, 181.
 Pouget, M., Silk, 248.
 Pottier & Stymus, Furniture, 114.
 Poure, Gillot, O'Kelly, & Co., Pens, 185.
 Pourtier, M., Fountain, 176.
 Poussielque, R. P., Decorations, 180.
 Poussielque-Rusand, Bronzes, 186.
 Powell, Hare, & Co., Iron ore, 15.
 Powell, E., Wines, 152.
 Powell & Bishop, Crockery, 143.
 Powers, D., & Sons, Oil cloths, 121.
 Powers & Weightman, Chemicals, 107.
 Powhatan Mills, Muslins, 118.
 Powrie, E., Beeswax and tobacco, 168.
 Praechter Bros. & Co., Corks, 192.
 Prahan, Council of, Photographs, 155.
 Prantl, F. A., Shades, 189.
 Prat, A., Wool, 246.
 Pratt, C., Clay, 47; Pottery, 172.
 Pratt, Charles, & Co., Oils, 109.
 Pratt, J. T., & Co., Tool chests, 135.
 Pratt, S., Salt, 171.
 Pratt, Read, & Co., Ivory ware, 264.
 Preis, I., Pearl buttons, 197.
 Premer, C., Furniture, 173.
 Prentice, J., Surveyors' instruments, 261.
 Presbyterian Board of Publication, 260.
 Preston & Merrill, Boxes, 139.
 Pretty, Grime, & Co., Paints, 121.
 Price, J. & C., & Bros., Bottles, 143.
 Price, M., Axes, 135.
 Price's Patent Candle Co., 141.
 Priest, W., Wool, 168.
 Prince, Franklin, & Bullock, E. L., Coal vein, 23.
 Princess Metallic Paint Co., 110.
 Prindle, G. H., Furs, 125.
 Prins, M., Carpets, 206.
 Priston & Merrill, Yeast powder, 108.
 Probst, G., 191.
 Prochaska, F., Soap, 192; Perfumery, 193.
 Pronfung, J. P., Carriages, 177.
 Protestant Missionaries in China, Publications, 234.
 Prouvost, Amadée, & Co., Wool, 182.
 Providence Forge Joint Stock Co., 74.
 Providence Franklin Society, Minerals, 13.
 Providence Gas-burner Co., 117.
 Providence Steam Mills, Cottons, 120.
 Providence Tool Co., Rifles, 133.
 Prowse Bros., Mangle, 174.
 Pruckner, D., 191.
 Przibram & Co., Alizarine, 192.
 Ptacnik, C., Pearl buttons, 197.
 Public Comfort, Department of, Cafe Leland, Newspapers, etc., 266.
 Public Works, New Zealand, 164.
 Pucci, S. A., Olive oil, 217.
 Puertas, L., Cholera medicines, 249.
 Pugh, J. T., Augers, 135.
 Pujol, L., Hair flowers, 249.
 Pujol, N., Ore, 99.
 Pullinger Co., Tools, 145.
 Pullman's Palace Car Co., 267.
 Pulvermacher, J. M., Instruments, 149.
 Purdey, J., Guns, 148.
 Puschner, F. A., Metal work, 197.
 Pusey, Jones, & Co., Iron work, 23.
 Putnam Mfg. Co., Cottons, 119.
 Putzin, K., 191.
 Quackenbush, H. W., Air gun darts, 128.
 Quarré, V., & Co., Gas shades, 117.
 Quebec Advisory Board, Limestone, 46; Brick, 172.
 Quaker City Organ Co., 264.
 Queen, J. W., & Co., Mathematics, 262.
 Queirel, J., Depuratives, 245.
 Quesual, Sheriff, Lime, 46.
 Queveda, S. A., Clay, 101; Ashes, 245; Herbs, 250.
 Quevedo, S. L., Copper, 101.
 Quevedo, S., Soap, 246.
 Quick, H. C., Wines, 162.
 Quigg, J. Travis, Mantels, 18.
 Quigley, P., Machinery Hall, 118.
 Quinn, N. S., Mats, 156.
 Quint, S. H., & Lee, Stencils, 135.
 Raccoon Furnace, Iron ores, 14.
 Raccoon Mining Co., Iron, 22.
 Racine Hardware Manufacturing Co., 19.
 Radieri Seniori Bros., Felted flannel and cloth, 218.
 Radiguet, Toys, 185.
 Raffin, Mrs. C. M., & Son, Tarlatans, 184.
 Raffl & Co., Statues, 180.
 Rairdon, J., Paper, 175.
 Rambaoh, C., Chair, 212.
 Rambone, W. G., Implements, 176.
 Ramm & Clausen, Hosiery, 215.
 Ramnäs Stock Co., Ores, 84.
 Rampazzini, F., Sulphur and chemicals, 216.
 Ramsay, D., Wools, 152.
 Ramsay, T., Paints, 172.
 Ramsden, D., Lastings, 123.
 Ramsden, S., Paper, 154.
 Rainsing, T., Linen, 209; Chocolate, 210.
 Randle, W. H., Medicines, 133.
 Rankin, J., Sand stones, 46.
 Ranniger, J. L., & Sons, Gloves, 190.
 Ransford, H., Brine, 47.
 Ransom, D. L., Desk, 114.
 Rap, E., Minerals, 99.
 Rasch, C., Glass articles, 193.
 Rath, P., Curtain, 115.
 Ravenet, sr., Combs, 185.
 Ravesteign, H. F., Stone, 205.
 Ravon, H., Drawings, 225.
 Rawbone, T., Cartridge creaser, 132.
 Rawlins & Son, Ultramarine, 142.
 Raymond, H., Minerals, 99.
 Raynald, J., Inks, 109.
 Reach & Johnston, Base balls, 266.

- Read, W. H., Colognes, 111.
 Read Carpet Co., 123.
 Read, J. C., Mats, 150.
 Read, R. B., Extracts, 150.
 Read, Stevenson, & Co., Stone, 47.
 Rectem, I., Lace, 204.
 Reed, A., & Co., Bookbinding, 131.
 Reed & Barton, Plated ware, 116.
 Reed, H., & Co., Vinegar, 157.
 Reefston Committee, Quartz, 40.
 Reenan, S. van. & Co., Wines, 163.
 Reese, Graff, & Woods, Iron, 20.
 Reeve, R. H. & B. C., Oil cloths, 121.
 Reves & Eastburn, Furniture, 114.
 Reeves, I. G., Wool, 158.
 Regnier, Economical House Ridge, 181.
 Regad, A., jr., Imitation diamonds, 184.
 Reich, H. & C., 188.
 Reighart, A., Shoes, 194.
 Reighart's Sons, Silks, 194.
 Reid, A. W., Coal, 40.
 Reid, J. & M., Paper, 176.
 Reid, R., Mantelpiece, 173.
 Reif, J., Model, 176; Jewelry, 195.
 Reiff-Huber, Bolting cloth, 200.
 Reifschneider, F., Velvet frames, 116.
 Reilly, E. M., & Co., Guns, 148.
 Reimandi, G., Cream of tartar, 216.
 Reims Chamb. of Commerce, Wool fabrics, 182.
 Rein, F. C., Acoustics, 149.
 Rein, Mrs. F. C., Trusses, 149.
 Reinecke, H., Horological matter, 262.
 Reinhardt, C., Bedstead, 173.
 Requia, Pinheiro, Hats, 244.
 Reisky, N. C., Furs, 129.
 Reitz & Bode, Stone, 17.
 Remaggi Bros., Linen goods, 218.
 Remain, Miss M., Fancy work, 175.
 Remington, E., & Sons, Firearms, 132.
 Remmy, R. C., Apparatus, 111.
 Remy-Thérion, Cottons, 203.
 Renfrew, G. R., & Co., Furs, 175.
 Renfrew Manufacturing Co., Cottons, 120.
 Renner & Buchler, Silverware, 190.
 Repper, J., Gloves, 194.
 Resende, L., Insects, 245.
 Resende, X., Pitchstone, 97.
 Resoagli, L., Quartz, 99.
 Rettig, C. A., Ores, 84; Iron, 85.
 Reukauff, G. C., Mirrors and Frames, 116.
 Revere Copper Co., 23.
 Revillon Bros., Furs, 185.
 Rey, senior, Linens, 203.
 Reyburn, Hunter, & Co., Vanes, 137; Lighting Rods, 263.
 Reymyre Glass Factory, 211, 212.
 Reynal, L., Pharmaceuticals, 179; Physicians' case, 186.
 Reyner, Fernandez, Dyed fabrics, 244.
 Reynolds, C. T., & Co., Paints, 109; Brushes, 139.
 Reynolds & Shaw, Jewelry, 128.
 Reynolds, J. G., Pipe clays, 143.
 Reynolds, J. N., Salt, 170.
 Reynolds & Volkel, Furs, 175.
 Reynaud, Flannel, 182.
 Rheims, A., Equipments, 186.
 Rhenigrantz & Walter, Shawls, 244.
 Rhenish Hard Rubber Goods Factory, 192.
 Rhenish-Nassau Co., 60.
 Rhode Island, State of, Educational, 258.
 Rhodes & Co., Iron ores, 15; Iron, 20.
 Rhode Island Cardboard Co., 131.
 Rhodes, I. M., Easy chair & bed, 133.
 Rhoner, Frank, & Co., Chairs, 115.
 Ribas, L., Pumice stone, 97.
 Ricci, Luigi, & Sons, Straw hats, 219.
 Ricasoli, Baron Bettino, Olive oil, 217.
 Rice, W. H., Wire work, 177.
 Rice, D., & Co., Publications, 260.
 Ritchie, E. S., & Sons, Instruments, 261.
 Rice, Jas. D., Lightning rods, 263.
 Rice, S. W., & Co., Uniforms, 266.
 Richard, B., Floor with border, 181.
 Richard Borden Mills, Cottons, 120.
 Richards & Hartley, Flint Glass Co., 113.
 Richards, J. J. & J. M., Jewelry, 127.
 Richards, Kearne, & Gasquoine, Alkali, 141.
 Richards, W. S., Coffee, 170.
 Richardson, C. D., & Co., Tents, 119; Umbrellas, 127.
 Richardson, J. S., & Sons, Linens, 145.
 Richardson & Lehnert, Gongs, 264.
 Richland Furnace Co., Iron ores, 14, 22.
 Richman, J. W., Wines, 162.
 Richmond Mfg. Co., Prints, 121.
 Richmond, H., Brushes, 139.
 Richmond, Backus, & Co., Ticket case, 114.
 Richter, F., Ultramarine, 179.
 Richter, G., Varnish, 192.
 Richter & Sons, Cotton velvets, 194.
 Richter, E., Embroidery, 195.
 Rickards, C. A., Sewings, 146.
 Rickman, R. F., Wool, 165.
 Riddle, J., Cheese, 156.
 Riddle, J., Son, & Co., Cotton warps, 118.
 Riedl, von Riedenstein, & Fredrich, China services, 193.
 Rigand & Co., Soaps, 179.
 Rigand & Dusard, Chemicals, 179.
 Rigby, J. & Co., Guns, 148.
 Riggins, G., Clay, 47; Bricks, 172.
 Riggs, J., Wheat, 162.
 Riggs & Bro., Nautical Instruments, 262.
 Righini Bros., Parasols, 219.
 Rigl, R., Iron bed, 193; Velocipedes, 198, Knife cleaner, 198.
 Rigollet & Co., Plasters, 179, 186.
 Riha, E., Colors, 192.
 Rijperman, C. J. F., Painting, 206.
 Riley & Lynch, Bag trimmings, 128.
 Riley & May, Billiard table, 173.
 Rinaldo, R., Olive oil, 216.
 Rio de Janeiro, Penitentiary House, Furniture, 244; Models, 244.
 Rio de Janeiro, Province of, Cordage, hats, etc., 244, 245.
 Rio-Grande-do-Sul, Prov. of, Minerals, 97; Stone bricks, 243; Leathers, 245.
 Rio-Grande-do-Norte, Prov. of, Shell boxes, Shoes, 244.
 Ripley & Co., Glassware, 113.
 Ripka & Elton Mills, Cottons, 121.
 Rischbieter, C., Shades, 189.
 Riso, I., Lime, 100; Stone, 100.
 Risteen, G. C., & Co., Blinds, 174.
 Risteen, J., Tools, 176.
 Ritchie, J., Wine, 157.
 Ritchie, J., & Son, Brass work, 177.
 Ritter & Co., Silverware, 190.
 Riverside Iron Works, 15, 21.
 Rizzi, A., Persian window blinds, 218.
 Rizzuto, C., Essences, 217.
 Roach, J. C., Furniture, 114.
 Robbins, Clark, & Biddle, Silverware, 116; Jewelry, 127; Cutlery, 136; Watches, 262.
 Robert & Leslie, Bricks, 172.
 Robert Bros., Lace, 184.
 Roberts, A. & P., Iron work, 22.
 Roberts, Henry, Iron, 22.
 Roberts & Co., Sandstone, 46.
 Roberts, J. B., Cooking apparatus, 173.
 Roberts, H. F., Manuscripts, 262.
 Robertson, R., Gold fields, 44.
 Robertson, J., Carriage, 151; Goat's fleece, 154.
 Robertson Bros., Photographs, 155.
 Robertson, W. W., Birds, 156.
 Robertson, J., Putty, 172; Shot, 176; Saws, 76; Lead pipe, 177.
 Robertson, P., Tools, 176.
 Robinson Bros. & Co., Soaps, 108.
 Robinson, Vincent, & Co., Carpets, 146.
 Robitaille, Dr., Limestone, 46; Ochre, 172.
 Robson, A., Nails, 214.
 Rocco, F., Olive oil, 217.
 Rocha Polybio Da, Furniture, 244.
 Rochester Tumbler Co., 113.

- Rockhill Iron and Coal Co., 13, 16, 21.
 Rockhill & Wilson, Clothing, 125.
 Rockland Slate Quarry, 46.
 Rockville Manufacturing Co., Woolens, 122.
 Rockwell & Phillips, Worsteds, 121.
 Rockwood, G. F., Photographs, 266.
 Rodeck Brothers, Jewelry, 195; Bronze articles, 196; Leather articles, 197.
 Rodgers, Wm. A., Automatic machines, 261.
 Rodgers Upright Piano Co., 265.
 Rode, C. N., Ink, 24.
 Rodriguez, S., Mustard, spurs, flax, anise, 250.
 Rodriguez, V., Saffron, harness, 250.
 Rodman, Robert, Doeskins, 121.
 Roe, W. A., Boots, 147.
 Roehle, L., Knobs, 192.
 Roesler & Achtelstetter, Asphalt, 60.
 Roger & Montlouis, Wall papers, 185.
 Rogers, I. I., Iron Co., 21.
 Rogers, C., & Bros., Coffin trimmings, 139.
 Rogers, M., 223.
 Roibon, F., Bow & arrows, 249; Herbarium, 250.
 Rolandi, G. B., Crystals and glasses, 218.
 Rolando, G., Ink, 217.
 Rolffs & Co., Cottons, 189.
 Rolin, H., & Sons, Cloths, 203.
 Romani, E., & Wife, Embroidery, 219.
 Roman, G., Coal, 99.
 Romano, G., Sulphur, 94; Salt, 216.
 Romay, G., Ores, 99.
 Romer & Co., Locks, 138.
 Rondeau Bros., Instruments, 186, 187.
 Root, R. C., Anthony, & Co., Stationery, 130.
 Rorhman, J. H., & Son, Tea caddies, 137.
 Rosquellas, J., Medicines, 249.
 Rörstrauds Stock Co., Feldspar, 84; Porcelain, 211; China, 212.
 Rosamond Woolen Co., 174.
 Rose, W., & Bro., Tools, 135.
 Rose, S. C., Porcelain, 233.
 Rose, Katie, Kapas, 242.
 Rosenbach & Co., Shirts, 125.
 Rosenberg, D., & Sons, Varnishes, 109.
 Rosenberg, S., Brandy, 168.
 Rosenberg & Cohn, Cottons, 189.
 Rosendahl Manufacturing Co., Pulps, 213.
 Rosengarten & Sons, Quinine, 107.
 Rosenlunds Spinning Co., Yarns, 212.
 Rosenstein, W., Chemicals, 187.
 Rosier, J., Boots, 154.
 Rosewig, A. H., Piano fortes, 264.
 Rospigliosi, Prince Clemente, Olive oil, 217.
 Rosselli, Del Turce, Olive oil, 216.
 Rosell, P. A., & Co., Wall paper, 213.
 Rosetti, C. G., Album, 219.
 Rossi, T., Wheat, 156.
 Ross, A., Petroleum, 40.
 Ross, N. S., Hematite, 45.
 Ross, J. L., Cottons, 119.
 Ross, R. D., Wines, 162.
 Rotali, F., Olive oil, 217.
 Roth, J., Silverware, 190.
 Rothschild Bros. & Gutman, Shirts, 126.
 Rott, F., Leather gloves, 195.
 Rouault, C., Medicine, 179.
 Roullies & Co., Brushes, 187.
 Roure, B., jr., Extracts, 180.
 Roure, B., Son, Extracts, 180.
 Rouse & Turner, Crockery, 112.
 Rousseau, David, Electrics, 263.
 Roussel, E., Woolen fabrics, cotton fabrics, 182.
 Rousseau, D., Bells, 137.
 Rous, E., Inkstand, 185.
 Routledge, W., Coal, 45.
 Roux, C., jr., Soaps, 179.
 Roux, L., Heaters, 181.
 Rowand, J. R., Gynecological apparatus, 134.
 Rowland, James, & Co., Iron, 19.
 Rowlands & Lewis, Waters, 36.
 Rowland, J. S. C., Inks, 110; Ink pad, 130.
 Rowland, B., & Co., Shovels, 135.
 Rowley, Wilson, & Co., Coal, 40.
 Rowney, G., & Co., Pigments, 142.
 Roxbury Carpet Co., 123.
 Royal Prussian Department of Commerce, Maps, 60; Furnaces, 60.
 Royal Inspection of Mines, 60.
 Royal Norwegian Com., Iron, 88.
 Royal Baking Powder Co., 107.
 Royal School of Art, Needlework, 144.
 Royal Gardens, Kew, Woods, 164.
 Royal Porcelain Works, 188.
 Royal Carpet Manufactory, 205.
 Royal Porcelain Manufactory, 209.
 Royal Staff, Maps, 210.
 Royal War Medical Department, 213.
 Royal Ordnance Department, Guns, 213.
 Royal Centennial Commission, Costumes, 213.
 Roy, J., & Co., Shawls, 122.
 Roy & Co., Invalid chair, 173.
 Rubaton, G., & Co., Soda, 179.
 Rubber Paint Co., 110.
 Rubber Co., 177.
 Rubidge Co., Wool, 169.
 Ruddenklau, J. G., Wheat, 164.
 Rudder, E. W., Linens, 151; Fibres, 122.
 Rudolph & Walter, Buffet, 266.
 Ruffer & Co., Zinc; Chemicals, 187.
 Ruffin, J. B., Hats, 184.
 Ruffner, Casper N., Chemicals, 199.
 Rufus, F. W., Books, 191.
 Rumieri, G., Hats, 219.
 Rumpp, C., Fancy leather goods, 129.
 Runcorn Soap & Alkali Co., 141.
 Ruperties, J., Revolvers, 132.
 Rimmel, E., Perfumery, 142; Valentines, 148.
 Rütschl, S., & Co., Silks, 200.
 Rutherford, A. W., Wool, 165.
 Rutland Marble Co., 17.
 Rusch, P. C., Furniture, 212.
 Rüse, A. H., Oils, 209.
 Rush & Co., Oils, 109.
 Rusk, T. J., Swing, 117.
 Russell, Jesse, Iron ore, 13; Emery, 19.
 Russell, W. W., Quartz, 44.
 Russell, W., Antimony, 45.
 Russell, S., Clay, 47.
 Russell, J., Cutlery, 136.
 Russell, T., Wool, 158.
 Russell, S., Bricks, 172.
 Russo, C. F., Olive oil, 217.
 Rustad, A. S., Furs, 215.
 Rutherford, A., Wool, 158.
 Rutledge, W., Fleeces, 158.
 Ryan, W., Hats, 126.
 Ryder, W. H., Tackle, 149.
 Ryder Bros., Cocoanut, 151; Arrowroot, 152; Cotton, 152.
 Ryder, G. H., Organs, 265.
 Ryffel & Co., Silks, 200.
 Ryn, J. H. I., Wines, 168; Brandy, 169.
 Saame & Co., Chemicals, 187.
 Sabin, J., & Sons, Books, 261.
 Sabro, I. C., Bitters, 210.
 Sachs, E. & C., 188.
 Sachse, F., Society shirts, 124.
 Sacre, L., Lace, 204.
 Safarana, Wax candles, 243.
 Sagamore Mills, Cottons, 120.
 St. Arnaud Pastoral Society, Cereals, 156.
 San Carlos, Sub-Commission of, Clay, 101; silk, 248.
 St. Catharina, Province of, Iron, 97; Furniture, flowers, inkstands and books, 244; Saddles, 245.
 St. Cloud Granite Quarrying Co., 17.
 St. Croix Paper Co., 176.
 St. Gobain, Chauny, & Cirey, Glass, 180.
 St. Gobain & Cirey, Mirrors, 181.
 St. Hubert's Vineyard Co., 157.
 Santiago del Estero, Stone, 100; Ashes, herbs, embroideries, etc., 245-250.
 St. John, F., Game, fish, 156.
 St. John's Stone Chinaware Co., 47.
 St. John Stoneware Factory, 172.

- St. John Woolen Mills, 174.
 St. Johnsbury Granite Co., 17.
 St. Joseph Convent, Embroidery, 175.
 San Juan, Government of, Minerals, 99; Stone, 100; Leather belts, hats, and saddlery, 248-259.
 St. Lawrence Foundry, Furnace, 173.
 San Luis, Province of, Minerals, 99; Gold, 101; Pestle, 100; Crockery, straw hats and needlework, 246-248; Caparisons, 250.
 San Luis, Ladies' Commission Province of, Cups, 246.
 San Paulo, Province of, Minerals, 97; Medicine and inks, 243; Furniture, 244; Harness, 245.
 Sak, Volders, J., Tickings, 203.
 Sakakuchi, Mrs. M., Crape wrappers, 238.
 Sakai, T., Fans & photographs, 238.
 Sakai Steam Power Mnfy., Cotton cloth, 239.
 Salas, M. M., Marble, 99.
 Salcedo, N. M., Silver, 101.
 Salem Shade Roller Manufacturing Co., 116.
 Salerno, Special Committee of, Linen goods; 218.
 Saliceto, Correction Department of, Cloths, 218.
 Saligo, V., Lace, 204.
 Salinella, Baron M., Rock salt, 216.
 Salomon, C., Map, 167.
 Salomon, Saul, & Co., Bookbinding, 167.
 Salta, Province of, Potash, furniture, etc., 245-250.
 Salter, J. G., Mirrors and tables, 116.
 Salter, S., & Co., Woolens, 146.
 Salter, W., & Sons, Wines, 163.
 Salvo, C., & Sons, Filigree work, 219.
 Sanderman, F. S., Burlaps, 145.
 Sanders, W., Cottons, 189.
 Sandford & Co., Bank books, 131.
 Sandhurst, City of, Photographs, 155.
 Sandrot, J., Stones, 100.
 Sands Bros., Inks, 142.
 Sandusky Tool Co., 136.
 Sandickens Stock Co., Ores, 84.
 Sanditkens Iron Works, 85.
 Sandy Creek Puddling Co., Quartz, 161.
 Sandy Creek Claim, Quartz, 161.
 Sangster & Co., Umbrellas, 148.
 Samex Bros., Woolens, 194.
 Samis, L. H., Chairs, 115.
 Sancon Iron Co., 15, 20.
 Santi, A. A., Perfumery, 217.
 Santini Brothers, Straw hats, 219.
 Samuelson, S. H., Peat, 84.
 Saracini, A., Olive oil, 217.
 Sarge, H. J., Turned wood, 174.
 Saratoga Victory Mnf Co., Cottons, 118.
 Saravia, P., Lime, 100.
 Sarettiére, G., Lamps, 218, 220.
 Sarg, Son, & Co., Soap, 192; Toilet articles 193.
 Sargent & Greenleaf, Locks, 138.
 Sasaki, G., Nara, Y., & Co., Surgical implements, 238.
 Sato, M., Porcelain, faience, 237.
 Sauberg, A., Chair, 212.
 Sauberlich, A., Chemicals, 187.
 Saunders, B., Clothing, 175.
 Saunders, I. G., Ladle, 173.
 Saunders, R., Ore dresser, 162.
 Saunders, W., Pharmaceuticals, 171; Perfumery, 172.
 Saunders & Co., Soaps, 205.
 Saunders, T., Canes, 175.
 Sauvage & Ruck, Bronzes, 186.
 Savage, A., & Son, Oil, 171.
 Savage, Keyser, & Stovell, Acids, 107.
 Savournin, W. H., Rouges, 110.
 Savary & Ronderleux, Jewelry, 184.
 Sawyer Woolen Mills, 121.
 Saxichner, A., Mineral water, 66.
 Saxon Thuringian Jt. Sik. Co., Chemicals, 187.
 Sbertoli, G., Carbonate of lead, 216.
 Scammano, Cav. M., Citron, 94.
 Scardefiehl, G. W., Gilders' materials, 19.
 Scarselli, E., Incrustation from casks, 217; Straw hats, 219.
 Scavo Vita Bros., Sulphur, 94.
 Schadek, F. L., Bonbons, 198.
 Schadelbauer, V., Pearl buttons, 196.
 Schærer, E., & Co., Silks, 200.
 Schaetzler, G. E., 188.
 Schafft, Fridolin, Sideboard, 114.
 Schahl, C. W., Silverware, 190.
 Schaller, J., Glass, 188.
 Schantz & Katz, Silverware, 190.
 Scharlach, L., jr., Roofing, 60.
 Scharneck & Co., Jewelry, 200.
 Schastez, G. A., Furniture, 114.
 Scheidecker, C., Machines, 186.
 Scheidig, S., & Son., 191.
 Scheidl, Frames and cornices, 193.
 Scheitlin & Widmer, Embroideries, 200.
 Scheller, F., Malt, 191.
 Schenck, J., Phantasmagoria, 262.
 Schenck, J. V., Mattress, 114.
 Schenck & Kohnberger, Rubber goods, 198.
 Schermerhorn, J. W., & Co., School material, 257.
 Schichijo, Y., Dolls, 238.
 Schildberg, H., & Co., Desks, 244.
 Schiller, J., & Co., Hats, 126.
 Schilling, V. C., Weapons, 191.
 Schimmel & Co., Ether, 188.
 Schindel, J. A., Stone, 60.
 Schindler, C. A., Piano stools, 265.
 Schisshyttan Molnebo Mfg. Co., Ores, 84.
 Schlaepfer, T. U., Muslin, 199.
 Schlafhorst & Brühl, Cottons, 189.
 Schlenk & Lutzenberger, 191.
 Schlesinger, M., Cards, 191.
 Schleuerpflug, E., Toys, 191.
 Schlieper & Baum, Calico, 189.
 Schlitter, Mary A., Batting, 118.
 Schloglmühl Paper Factory, 197.
 Schlotterbeck, A. S., Thermometer, 262.
 Schmidt, W., & Sons, Haberdashery, 195.
 Schmid, J. E., Glass articles, 193.
 Schmidl, S., Oils, 193.
 Schmidt & Sons, Woolens, 194.
 Schmidt, A., Waters, 101.
 Schmidt, A., & Co., Glass, 202.
 Schmidt, Devillez, & Co., Glass, 202.
 Schmitt, F., Wine, 157.
 Schmitt, L., Wheat, 156.
 Schnable, J., Carpets, 294; Laces, 195.
 Schnabl & Co., Paper, 197.
 Schneider, C. F., Lint, 199; Knives, 201.
 Schneider, W., Penknives, 198; Toilet articles, 196.
 Schnyder, J. J., Hair fabrics, 199.
 Schoenfeld, E., jr., Silverware, 190.
 Schoffel, A., Papier-mache boxes, 197.
 Schofield, S., Blankets, 122.
 Schokking, J. A. J., Tubes, 206.
 Scholler, J. P., Cloth, 189.
 Scholler, Ph. Jacob & Sons, Wire goods, 189.
 Scholz, P., Varns, 189.
 Schondorfer, A., Mother of pearl, 195.
 Schomacker Piano Co., 264.
 Schott, H., Papers, 191.
 Schottle, G., Furniture, 188.
 Schough, R., Ores, 84.
 Schoverling & Daly, Rifles, 132.
 Schradin, A. F., 191.
 Schreiber & Neffen, Glassware, 193.
 Schreiber, F. A., Underwear, 147.
 Schreiber, W. A. H., Clays, 18.
 Schreiner, A., Utensils, 189.
 Schrenkeisen, M. & H., Chairs, 114.
 Scribner, Armstrong, & Co., Books, 261.
 Schroder, T., Ore, 99.
 Schroeder, C., Wines, 157.
 Schroeder, Wilhelm, & Co., Silks, 200.
 Schubert, F., Album, 200.
 Schuberth, J., Wooden blinds, 194.
 Schucani & Wegman, Liquors, 210.
 Schuchardt, T., Chemicals, 187.

- Schultz, Carl H., Siphons, 19.
 Schultz, T., Model, 210.
 Schumm, P., Coverlets, 120.
 Schunemann, L., Dolls, 191.
 Schuyler, Hartley, & Graham, Equip., 124.
 Schwabe, Salis, & Co., Prints, 145.
 Schwan, W. W., Pearl buttons, 197.
 Schwanhaüsser, Pencils, 191.
 Schwarz, Ivon, Gas burners, 189.
 Schwarz & Son, J., Hat bands, 195.
 Schwartz, I., Pearl buttons, 197.
 Schwartz, W., Pearl buttons, 197.
 Schwarzenbach, L. J., Silks, 200.
 Schwarzenhorn, F. von, Porcelain, 204.
 Schwarzer, F., Cithers, 264.
 Schwarzmänn & Co., Clothing, 194.
 Schwarzmänn, H. J., Designs, 267.
 Schweigert, W., & Co., Cigars, 151.
 Schweinburg, G., Carpets, 194.
 Schwizer, J., Buttons, 197.
 Sciacca della Scala, Baron, Olive oil, 217.
 Scioto Fire Brick Co., 111.
 Scioto Furnace, Iron ores, 14; Iron, 21.
 Scocchiolini, A., Pomatum, 217.
 Scorgie, Wight, & Co., Granite, 17.
 Scott, J., Wheat, 156.
 Scott, J. W., & Co., Albums, 266; Shirts, 125.
 Scott, G., Yellow ware, 112.
 Scott, G. B., Photographs, 162.
 Scott, Q. A., Dental specimens, 134.
 Scott, W. & C., Firearms, 148.
 Scovill Manufacturing Co., Brass, 23.
 Scuderi, G., Cream of tartar, 216.
 Scurati Manzoni de G., Skein of cotton 218.
 Seabury & Johnson, Plasters, 133.
 Seavey, Foster, & Bowman, Raw silk, 124.
 Seaman & Co., Grindstones, 47.
 Secor, J. B., Automaton birds, 264.
 Secretan, E., Copper sheets, 181.
 Secombe, R., Milk, 151.
 Seefeldt, Wm. E., Musical instruments, 264.
 Seeley, I. B., Trusses, 134.
 Sewald, M., Leather ware, 197.
 Seide, J., Haberdashery, 195; Rubber articles, 198.
 Seidler & May, Sofa bed, 115.
 Seilles les Audenne & Bouffloulx Co., Bricks, 201.
 Seirat, C. H. A., Peat, 79.
 Scitteles, D., Gloves, 190.
 Sefu, Y., Porcelain, 237.
 Seguin, Althocinum, 180; Dyes, 180.
 Segant, Tools, 186.
 Segura, R., Stone, 100.
 Sell, C., Soap, 192.
 Sellers, C. P., Brooms, 139.
 Sellers, Wm., & Co., Iron work, 22.
 Selsor, G., & Co., Hammers, 135.
 Selwinn, H., Harness, 178.
 Semple, S., & Sons, Spool cotton, 118.
 Seurin, J., Varnish, 180.
 Sensfelder, A., Pomades, 180.
 Serta, G. N., Heaters, 202.
 Servant, C. J., & Co., Velvets, 183.
 Sergeant, T., Farina, 180.
 Serravalle, C., Chemicals, 245.
 Seth Thomas Clock Co., Clocks, 262.
 Sévène, Barral, & Co., Failles, 183.
 Seventh-Day Adventist Pub. Asso'n, 261.
 Sevey, J. A., Whalebones, 128.
 Sewing Machine Factory, Furniture, 188.
 Semour, H., & Co., Shears, 136.
 Seydoux, Sieber, & Co., Wool fabrics, 182.
 Seymour, H., J., & Co., Chairs, 114.
 Shaffner & Stringfellow, Cotton, 121.
 Shalter, R. M., Carrick furnace, 13; Iron, 21.
 Shannon, J. B., Locks, 137.
 Shantz, J. Y., Mirror, 173; Buttons, 175.
 Sharp, J. S., Salt, 171.
 Sharpless & Sons, Costumes, 126.
 Sharpless, J. M., & Co., Logwood extract, 110.
 Sharp's Rifle Co., 132.
 Sharswood, William, Minerals, 13.
 Shaw, A., & Co., Brooms, 153.
 Shaw, F. K., Wine, 157.
 Shaw, J. G., Cotton warps, 118.
 Shaw, J. H., & Co., Frames & glasses, 116.
 Shaw, P., Copper pyrites, 44; Potassium, 171.
 Shaw, Thomas O., Minerals, 14; Paint, 110.
 Shearer, Smith, & Co., Granite, 29.
 Shedd, J. H., Engineering, 266.
 Sheldon & Fenton, Sewings, 146.
 Sheldon, H. L., "Pacific Commercial Advertiser," 242.
 Sheldon & Co., Books, 260.
 Sheldons & Slason, Marble, 17.
 Shelley Iron Co., 13, 21.
 Shenandoah Gold Mining Co., 36.
 Shepherd & Lloyd, Scales, 135.
 Sheppard, Arrison, & Sheppard, Curtains, 213.
 Shepperd, E., Quartz, 161.
 Shetucket Co., Cottons, 119.
 Shibata, B., Embroidery, 238.
 Shibe, J. D., Base balls, 266.
 Shinn, W. P., Steam engineering, 266.
 Shisui, H., Scales, 239.
 Shimidzu, F., Bamboo ware, 238.
 Shinoyama, T., Bronzes, 238.
 Shipley, H. W., Cutlery, 136.
 Shoemakers' Society, 184.
 Shoemakers Co-operative Society, 219.
 Shomi, I., Bronzes, 238.
 Shoninger, B., Organ Co., 264.
 Shoobert, J., Iron bark, 151.
 Shoolbred, J., & Co., Furniture, 144.
 Shore Mills, Cottons, 120.
 Shorey & Co., Clothing, 174.
 Shroder, F., & Co., Cottons, 119.
 Siacca della Scalla, Baron, Silk, 219.
 Sibeth, O. H., Map, 266.
 Sibley, A. H., Ores, 44.
 Sibley, Col., & J. McIntyre, Galena, 45.
 Sibley, Freeman K., Emery, 19.
 Sicard, J. G. de, Stone, 99.
 Sickling, H., 191.
 Siddall Bros., Vellum printing, 131.
 Siebenpfeiffer, C., 191.
 Siegenthaler, S., Felt boots, 199.
 Siegler, S., Bleached linen, 194.
 Siegerlaud Mine Owners, 60.
 Siegmund, W., Woolens, 194.
 Siemens, Charles W., Metal plates, 30.
 Siemsen, J., Hemp, 189.
 Sigler, C. & J., Glass signs, 116.
 Siles, Ignazio, Essences, 217.
 Silicate Paint Co., 142.
 Sillery Convent, Embroidery, 175.
 Silliman Chemical Works, 107.
 Silva, F., Cotton, 247.
 Silva, M., Embroidered cloth, 248.
 Silva, Rebello da, Cotton fabrics, 244.
 Silva, X. da, Wood articles, 244.
 Silver Islet Co., Silver, 48.
 Silver, I., Marble, 46.
 Silver Lake Co., Braided cords, 224.
 Silver Spring Bleaching & Dyeing Co., 119.
 Simays, E., Enamel work, 173.
 Simes, W. F., & Sons, Camphor, 107.
 Simon, H., Silks, 124.
 Simon, May, & Co., Laces, Curtains, 147.
 Simonis, I., Cloth, 203.
 Simons & Co., Tiles, 180.
 Simons & Malcom, Mats, 164.
 Simons, Opdyke, & Co., Jewelry, 127.
 Simons, P. Buildings, 206.
 Simonsen, C., Newspaper, 209.
 Simpson & Co., Piano fortes, 264.
 Simpson & King, Prints, 145.
 Simpson, I., Hosiery, 174.
 Simpson, J., Coal, 45.
 Simpson, W., & Sons, Prints, 121.
 Singer, J. W., & Son, Metal work, 144.
 Singer, M., Anilines, 201.
 Singer, Nomick, & Co., Steel, 20.
 Sinkiyomida, G., Porcelain, 237.
 Sinsz, P., Glaziers' diamonds, 135.
 Sirletti, F., Teeth, 210.

- Sirot, C. & L., Nails, 186.
 Sisters of Charity, Embroidery, 233.
 Sittig, J., Buttons, 196.
 Skead, Sand stones, 46.
 Skelton, Tooke, & Co., Shirts, 174.
 Skiokawa, B., Picture frames, 237.
 Skinner, T., Table, 115.
 Skejiro, Notomi, 236.
 Skellington, S., Whip lashes, 178.
 Skelton & Co., Street lamp, 145.
 Skriván J., & Son, Hats, 195.
 Skultuna Stock Co., Copper, 85.
 Slade Mills, Cottons, 120.
 Slaughter, T., Locks, 138.
 Sliva, S. G. Da, Inks, 243.
 Slater & Perry, Boots, 175.
 Smart, J., Stoves, 173; Presses, 175; Hardware, 177.
 Smith, A., Wheels, 178.
 Smith, A., & Sons, Carpet Co., 123.
 Smith & Campion, Furniture, 113.
 Smith, C. K., & Co., Oils, 109.
 Smith, C. L., Shirts, 125.
 Smith, E., & Co., Varnishes, 110.
 Smith, Frederick, & Co., Iron wire, 29.
 Smith, G. J., Lace, 147.
 Smith, G. S., Wine, 157.
 Smith, H. E., & Co., Cotton yarns, 119.
 Smith, H. H., Clothing, 174.
 Smith, Hanway, & Co., Baking powder, 108.
 Smith's Homœopathic Pharmacy, 133.
 Smith, J., Wines, 165.
 Smith, J., & Sons, Needles, 148.
 Smith, J. W., Needles, 147.
 Smith, J. Y., Shirts, 118.
 Smith, B. N., & Co., Piano carvings, 264.
 Smith, J. L., Maps, 257.
 Smith, W. S., Engineering, 266.
 Smith, M. L., Paint, 110.
 Smith, R. H., & Co., Saws, 176.
 Smith, W., Peat, 45.
 Smith, W. M., Casket trimmings, 139.
 Smith & Raye, Earthenware, 173.
 Smith & Son, Biscuits, 157.
 Smith & Wilby, Shoddy, 174.
 Smithers, J. & G., Soaps, 167; Wax, 168.
 Smyth & Pennington, Files, 136.
 Smyth, R. B., Maps, 36.
 Smyth & Co., Hosiery, 147.
 Smuts, Miss G., Flower articles, 171.
 Smart, W., Oven, 144.
 Snell Manufacturing Co., Augers, 135.
 Snider, F. H., Firearms, 132.
 Snow, J. H., Ship, 267.
 Snowden, E. G., Wine, 157.
 Snyder, C. R., Table, 114.
 Snyers, Rang, & Co., Furniture, 202.
 Social Manufacturing Co., Cottons, 119.
 Söderén, F. W., Knives, 214.
 Soergel & Stollmaier, Silverware, 190.
 Sohn, L., & Delabre, Jewels, 180.
 Sohn & Delabre, Porcelain flowers, 185.
 Söhnlein, H., 191.
 Sohrada, A., Turners' articles, 197.
 Sohmer & Co., Piano fortes, 264.
 Soleliac, A., & Sons, Silks, 124.
 Solenhofen Joint Stock Co., Stone, 60.
 Solinas, A. G., Olive oil, 216.
 Solmans, A., Felt hats, 126.
 Salvay & Co., Chemicals, 179, 201.
 Somerville, P. T., Monument, 46.
 Sommelet, C., Cutlery, 186.
 Sommerschuh, W. L., Earthenware, 193.
 Soper, W., Rifles, 148.
 Sordoillet, J. F., Jewelry, 184.
 Sorensen & Kloystad, Carriages, 216.
 Sotomayor, P., Counterpane, 246.
 Sosa Rafael, Caparison, 250.
 Souchet & Co., Enamels, 180; Enamel flowers, 185.
 Soutar & Co., Tobacco, 170.
 South Australian Commission, Quartz, 161; Maps, 162; Reaping Machine, 163.
 South Boston Mfg. Co. Cannon, 132.
 Southworth, Co., Paper, 130.
 Souza, Paulo, Argil, 97.
 Sower, Potts, & Co., School material, 257.
 Soyer, P., Jewelry, 184.
 Spaddro, G. P., 220.
 Spahn, C. C., Silverware, 190.
 Sparks, T. W., Drop shot, 132.
 Spaulding, D. S., Jewelry & combs, 128.
 Spedalieri, Baron F., Sulphur, 94.
 Spellier, L. H., Regulator, 262.
 Spence, J. C., Stained window, 173.
 Spence, P., Alum, 141.
 Spencer, H., Drain tiles, 172.
 Spencer, J., Dentistry, 151.
 Spencer, O. B., Oil painting, 242.
 Spencer Optical Manufacturing Co., 263.
 Speth, K. L., Cabinet ware, 115.
 Sphynx Tooth-Paste Manufacturing Co., 108.
 Spiegelberger, 188.
 Spillman, H., Trusses, 134; Tools, 201.
 Spilur Bros., Tools, 176.
 Spinelli, R., Soaps, 172.
 Spiral Elliptic Spring Works, 113.
 Spranger, N., Silverware, 190.
 Spring & Wesson, Firearms, 132.
 Spurr, C. W., Wood hangings, 267.
 Squires, E., Jellies, 152.
 Stacy, G., Nails, 177.
 Staes, S., Oils, 201.
 Stafford & Co., Cotton yarns, 118.
 Stafford Mills, Cottons, 120.
 Stäheli-Wild, C., Embroideries, 200.
 Stählberg, L. F., Cutlery, 217.
 Stambach, J. A., & Co., Furs, 129.
 Stanley Bros., Files, 143.
 Stanley Rule & Level Co., 135.
 Stanley Works, Hinges, 137.
 Stantien & Becker, Amber, 60.
 Stanton, M., & Co., Paper hangings, 176.
 Stanway, W., Chairs.
 Stapfer, J., Silks, 200.
 Stapleton Salt Works, 171.
 Star Furnace Co., Iron ores, 14; Iron, 27.
 Star Knife Co., 136.
 Star Tool Co., 135.
 Stark Mills, Cottons, 120.
 Starr, J., Barytes, 45.
 Starr & Marcus, Precious stones, 127.
 Starr Knitting Co., 126.
 Starr Mfg. Co., Skates, 176; Nails, 177.
 State of Alabama, Minerals, 15.
 State of Delaware, Ores, productions, 16.
 State of Indiana, Ores, minerals, 16.
 State of Michigan, Minerals, ores, 16; Metals, 23.
 State of New Jersey, Ores, 16; Metals, 19; Mine maps, 23; Pottery, 112.
 State of Ohio, Minerals, 16.
 State of Wisconsin, Minerals, 16.
 Steam Netting Factory, Nets, 189.
 Steam Ticking Co., Linens, 189.
 Steam Woolen Co., 122.
 Stearic Light Co., Soap, candles, 243.
 Stearns, Frederick, Chemicals, 107.
 Stearns, J. N., Silks, 124.
 Stechel, Oils, 243.
 Steck, G., & Co., Pianos, 265.
 Steel & Garland, Grates, 144.
 Steel Co. of Canada, Iron ores, 45, 48.
 Steele, J., Chairs, 114.
 Steen, C., & Son, Maps, 210.
 Steen, V., Soaps, 214.
 Steenberg, A., Newspaper, 209.
 Steffan, F., & Co., Woolens, 122.
 Stefsky, J., Military goods, 194.
 Stehr, C., Meerschauins, 128.
 Steiger & Co., Embroideries, 200.
 Steiger, E., School material, 257.
 Stein, C., Furniture, 193.
 Steindl, C., Pearl buttons, 197.
 Steiner & Kolliner, Garnet, 195.
 Steiner, H., Jewelry, 161.
 Steinhauer & Co., Silverware, 190.
 Steinhilber, A., Leather gloves, 195.

- Steinmetz, F., Veneers, 198.
 Steinway & Sons, Piano fortes, 264.
 Stelwagon, J., & Sons, Roofing paper, 131.
 Stenbergs, G. (widow), Linens, 212.
 Stenman, F. A., Locks, 214.
 Stenstrup, Sign painting, 209.
 Stephens, G., Ores, 44.
 Stephens, H. C., Inks, 142.
 Stephens, P. E., Rifle, 176.
 Sterling, E., Coal, 45.
 Stern, W., & Co., Papers, 191.
 Stern, Portland Cement Factory, 60.
 Sternberger, L. & S., Shirts, 125.
 Sternickel & Glucher, Woolens, 194.
 Stetson, J. B., & Co., Hats, 126.
 Stetton Chamotte Works, Retorts, 188.
 Stevens, A. J., Floor cloth, 174.
 Stevens Institute of Technology, Engineering, 257.
 Stevens, J., & Co., Firearms, 132.
 Stevens Linen Works, 121.
 Stevens, T., Silks, 147.
 Stevenson & Elliott, Landau, 154.
 Steward, G., Medicine chest, 176.
 Stewart, A., Mechanical instruments, 262.
 Stewart, A. C., Wool, 160.
 Stewart, A. C., & Co., Hair, 169.
 Stewart & Co., Photographs, 155.
 Stewart & Co., Iron wire, 21.
 Stewart, G., Books, 167.
 Stewart & Ferguson, Wheat, 156.
 Stewart & Mattson, Hardware, 137.
 Steward, J., Ale, 157.
 Stewart, Moir, & Muir, Curtains, 147.
 Stewart, W. W., Copper, 44.
 Stiasny, F. & M., Gloves, 194.
 Stief, J., 191.
 Stieff, C. M., Pianos, 265.
 Stiff, J., & Sons, Terra cotta, 143.
 Stiles, Mrs. E. W., Desk, 114; Paper file, 129.
 Stille, A., Instruments, 213.
 Stimson & Babcock, Varnishes, 110.
 Stitt, Price, & Co., Stone, 18.
 Stobie, J., Iron ore, 45.
 Stock Co. for Mnfg. Bricks, 94, 218.
 Stockbridge Iron Co., 13.
 Stockenströme, A. von., Ores, 84.
 Stockholm Woolen Mnfg. Co., 212.
 Stocking, Z. S., Stone, 18.
 Stocklassa, F., Brushes, 214.
 Stockwell Self-lighting Gas Burner Co., 117.
 Stoddard, R. T., Book supporter, 129.
 Stoddart, J. M., & Co., Literature, 260.
 Stoeber & Segitz, 188.
 Stoefs, G. G., Jewelry, 204.
 Stoger, L., Leather gloves, 195.
 Stokes & Parish, Elevator, 267.
 Stolze, F. E., 191.
 Stolzle's Sons, Glassware Co., 173.
 Stone Chinaware Co., 173.
 Stone, General, 223.
 Stoneman, A., Springs, 154.
 Stoneman, E., Springs, 155.
 Storer, D., & Sons, Colors, 142.
 Storer, J., Fountains, 144.
 Stork & Sinsheimer, Silverware, 190.
 Stork, C. F., Colored goods, 205.
 Stott, C. H. & F. H., Flannels, 123.
 Stövesandt & Kollmar, Furniture, 188.
 Strahan, Hodgson, & Co., Collars, 125.
 Stramitzer, I., Tape laces, 195.
 Stranaberg, J., Brass, 214.
 Strandell, A. L., Hardware, 214.
 Strange, W., & Co., Silks, 124.
 Straschitz, B., Clothing, 194.
 Straub, A., Leather gloves, 195.
 Straudberg, F. A., Ink, 211; Perfumery, 211.
 Straus, D., & Co., Curtains, 200.
 Strauss, J. E., Iron, 19.
 Strauss, J. E., & Co., Galvanized iron, 139.
 Straw Hat Stock Co., 219.
 Strignas Match Mnfg., 211.
 Stringer & Co., Baking powder, 153; Pickles, 157.
 Stringer, J., Locks, 177.
 Strobel, I. P., 191.
 Strohmaier & Co., Silverware, 190.
 Strow, Wile, & Co., Crucibles, 18.
 Struthers, W., & Sons, Mantels, 17.
 Strzygowski's Sons, Woolens, 194.
 Stunzi & Sons, Silks, 200.
 Sturges Montserrat Co., West India goods, 142.
 Sturzenegger & Rutz, Edgings, 200.
 Such, George, Clays, 18.
 Suhr, W., Chemicals, 187.
 Suchy, A., Leather gloves, 195.
 Sullivan, J., Filters, 153.
 Sullivan, F. W., & Co., Cork pad, 125.
 Sulzberger, D., Flavors, 110.
 Sumi Yoshiu, K., Chairs, 239.
 Sundström, J. O., Ores, 84; Iron, 85; Nails, 214.
 Sung Sing Kung, Furniture & embroidery, 233.
 Supplicity, Insects, 245.
 Surrahammers Stock Co., Iron, 85.
 Surveyor General of Victoria, Photos, 155.
 Sutherland, J., Coal, 45.
 Sutro Bros., Braids, 124.
 Sutter-Dorig, R., Embroidery, 200.
 Sussfeld, Lorsch, & Co., Clocks, 181.
 Susse Bros., Bronzes, 181, 186; Stationery, 185.
 Susuki, M., Picture frames, 237.
 Susiki, Y., Fayence, 237; Striped silks, 239.
 Sutcliffe, Miss E. W., Needle work, 175.
 Sutherland, A., Boots, 175.
 Swain & Adeney, Whips, 147.
 Swain & Co., Soap, 150.
 Swanison, Bailey, & Co., Cottons, 145.
 Swallow, J. E., Dental appliances, 134.
 Swansea Tin Plate Co., 30.
 Swasey, I. N., Billiards, 114.
 Swedmark, G., Gloves, 212; Jackets, 212.
 Sweeny, M., & Bros., Clothing, 175.
 Sweet, R. J., Copper glance, 44.
 Sweet, Orr, & Co., Clothing, 125.
 Sweet, S. H., Kaolin, 47.
 Swenkels, W., Yarns, 205.
 S. Wilkins & Orcut Manufacturing Co., Sad irons, 117; Shawl carriers, 128; Alarms, 138.
 Swiss Manufacturing Co., Rifles, 200.
 Svalling, E. M., Knives, 214.
 Svanberg, C. E., Boots, 212.
 Svanholm Brewery, 210.
 Synnot, M., Wool, 158.
 Synnott, G., & Co., Wool, 158.
 Sydney Meat Preserving Co., 152.
 Syracuse Chamber of Commerce, Repos, 147.
 Sykes, J., & Co., Corsets, 147.
 Symonds, S. G., Organ pipes, 265.
 Tabard, Benoit, & Co., Silks, 183.
 Tabourot & Pacault, Shirts, 183.
 Tack Loong, Earthenware, 232.
 Tacony Chemical Works, 107.
 Tadatsune, Asami, 236.
 Tadei, G., Straw hats, 219.
 Tagliabue, Guiseppe, Barometers, 262.
 Tagliavia, F., & Co., Minerals, 94.
 Tahon, F., Copper plates, 186.
 Tailors' Society, Clothing, 183.
 Tainsy, F., Marbles, 202.
 Taizan, Y., Faience, 237.
 Takaharhi, D., Porcelain, 237.
 Talamon, Son, & Co., Wool fabrics, 182.
 Tallmadge & Co., Essential oils, 111.
 Tamai, T., Muira, G., Jinuma, B., Books, 238.
 Tamayo, S., Clay, 100.
 Tambeur, M., Weapons, 204.
 Tametake, Ishida, 236.
 Tanaha, K., Writing paper, 239.
 Tancrede Bros., Glues, 179.
 Tangeman, G. P., Paper and felt, 131.
 Tangeman, J. H., & Co., Paper, 132.
 Tanzan, S., Porcelain and Faience, 237.
 Tapisser Sons & Deboy, Silks, 183.
 Tarawaka Committee, Views, 164; Sand, ores, 40; Phormium, 165.

- Tarr Alpaca Co., 123.
 Tarr, H. S., & Son, Dry levels, 262.
 Taru, S., Measures, 239.
 Tarussi, L., Bros., Olive oil, 217.
 Tassinari & Chatel, Silks, 183.
 Tassi, P., Marble, 94.
 Taste, J., Cloth and thread, 203.
 Tatton, P. W., Map New Zealand, 164.
 Taunton Crucible Co., 19.
 Taylor, A. B., Toilet waters, 110.
 Taylor, B. K., Hat, 263.
 Taylor, C. F., Orthopedic apparatus, 133.
 Taylor, J., Wheat, 156.
 Taylor, J. H., Tooth paste, 134.
 Taylor, J. K., Clothing, 175.
 Taylor, J. J., Safe, 173.
 Taylor, J. & M., Carpets, 123.
 Taylor, J. P., Battery gun, 132.
 Taylor, Mrs. R., Mat, 163.
 Taylor, R., Boots, 175.
 Taylor, S. T., Dressmaking, 125.
 Taylor, T., Burnishers, 135.
 Taylor, C. R., & Co., Soaps, 111.
 Taylor, D. F., & Co., Pins, 148.
 Taylor & Farley Organ Co., 265.
 Taylor, N. & G., Co., Tin, 23.
 Taylor, R. F., & Son, Clothing and cloths, 174.
 Taylor, Robert, & Co., Crucibles, 18.
 Taylor, Th. H., & Co., Tweeds, 174.
 Taylor, W. O., & Sons, Chairs, 114.
 Tecumseh Mills, Cottons, 120.
 Tecumseh Works, Brine, 47.
 Tecumseh Iron Co., 13, 21.
 Tecumseh Works, Salt, 171.
 Telberg Woolen Manufacturing Co., 205.
 Tellini, V., Olive oil, 216.
 Tellini, D., & Co., Olive oil soap, 226.
 Tello, J., Handkerchief, 248.
 Templeton, J., & Co., Carpets, 146.
 Templeton, J. & J. S., Carpets, 146.
 Tenner, A. B., Blinds, 188.
 Tennessee, State of, Educational, 258.
 Teramura, S., Cottons, 237.
 Terrillon, L., Shawls, 182; Fancy goods, 183;
 Trimmings, 184.
 Ter Horst, J. H., Matting, 205.
 Terwilliger & Co., Safes, 115, 138; Safe locks,
 138.
 Terramola, D., Salt, 245.
 Testi, Dr. U., Dental machines, 220.
 Tetlow, H., & Bro., Perfumery, 110.
 Teufel, J. J., Surgical instruments, 134.
 Teugels, E., Furniture, 202.
 Thackara, Buck, & Co., Gas fixtures, 117.
 Thalheimer & Hirsch, Shirts, 124.
 Thevenot, F., Cutlery, 186.
 Thieben, E., Shawls, 194.
 Thiellay, E. H., Hair dyes, 142.
 Thierry, China, 180.
 Thiery, A., Tables, mirrors, 115.
 Thinet, Cutlery, 186.
 Thiry, jr., Iron bird cage, 181; Locksmiths'
 goods, 189.
 Thomachot, Thuillier, Scissors, 186.
 Thomas, A. W., Bustles, 125.
 Thomas Bros., Chemicals, 179; Raw silk, 182.
 Thomas, C. F., Indexes, 131; Skins, 158.
 Thomas, F., Silks, 182.
 Thomas, J., Ruches, 127.
 Thomas, R., Stove, 173.
 Thomas, W. H. B., Minerals, 15.
 Thomas Iron Company, 13, 20.
 Thompson, A., Paints, 110.
 Thompson, C., Perambulator.
 Thompson, E. O., Clothing, 125.
 Thompson, G. T., & Sons, White lead, 172.
 Thompson, Wm. S., Stone, 17.
 Thompson, Perley, & Waite, Chairs, 115.
 Thompson & Young, Buggy, 177.
 Thomson, J., Furniture, 173.
 Thomson, J. S., Inks, 110.
 Thomson, R., Oils, mats, leaf hats, stationery,
 cinchona, razor strops, fabrics, woods, veg-
 etables, 170; preserves, 171.
 Thonet Bros., Furniture, 193.
 Thorn, C., Carriages.
 Thorn, S. S., Wire, 138.
 Thorne, G., Silkworm eggs, 152.
 Thornber, U., Wines, 163.
 Thornton, E., Stove, 145.
 Thornton, S., & Sons, Cottons, 118; Woolens,
 121.
 Thorpe, J., & Co., Furniture, 146.
 Thrum, T. G., Photograph of Honolulu, 243.
 Thurston, R. M., Mech. engineering, 266.
 Thwaites, Miss F. C., Paintings, 168.
 Tidström, C. W., Books, 213.
 Tiebout, W. & J., Hardware, 138.
 Tiemann, G., & Co., Surg. instruments, 133.
 Tiffany & Co., Silver ware, 116; Jewelry,
 precious stones, 127; Stationery, 129;
 Watches, 262.
 Tilden & Co., Pills and extracts, 108.
 Tileston & Hollingsworth, Paper, 130.
 Tilt, B. B., & Son, Silks, 124.
 Tillson, Davis, Granite, 17.
 Timbrell, A., Silk, 154; Silkworms, 156.
 Timon, A., Trusses, 206.
 Timm, W., Ropes, 215.
 Timms Bros., Wools, 158.
 Tims, W., Homeopathics, 133.
 Tin, Finlay, Spoons, 173.
 Tinworth, G., Terra Cotta, 143.
 Tin Plate Decorating Co., 137.
 Tinogasta, Prov., Sub-com. of, Ores, 99.
 Tirapegui, R., Saddle, 250.
 Titus, E., & Sons, Flannels, 123.
 Tittel & Krüger, Wools, 189.
 Tobin, J. F., Whalebone, 128.
 Tobique Gypsum Co., 47.
 Tobler, U. & A., Embroidery, 200.
 Todd, A. M., Peppermint oil, 109.
 Todd, E., & Co., Toothpicks, 128; Gold
 pens, 130.
 Toin, Peh Mei, Porcelain, 233.
 Toiray, M., Inks, 180.
 Toiray, M. G., Stationery, 185.
 Toit, A. L., Grapes, 168.
 Tolhurst, G. E., Gold ingots, 40.
 Toll, Charles, Silex, 18.
 Tolley, J. & W., Guns, 149.
 Tomei, A. F., Sample of pavements, 218.
 Tomek, W., Pearl buttons, 197.
 Tomioka Steam Manufactory, Silk, 240.
 Tomita, S., Barege, 237.
 Tomkinson & Adam, Carpets, 146.
 Tong Chock-Hing, Porcelain, 233.
 Tong Chou Hing, Ink, 233.
 Topart Bros., Imitation stones, 184.
 Torchon, C., Pharmaceuticals, 179.
 Tornberg, O., Boots, 212.
 Torelli, J., Crockery, 218.
 Toronto Gold Mining Co., 44.
 Toronto Tweed Co., Flannels, 174.
 Torrence, G. N., Cork mattresses, 114.
 Torrey, W. S., Soaps, 172.
 Toshimichi, Okubo, 236.
 Tostrup, J., Silver work, 215.
 Touchard, E., Ornaments, 181; Church or-
 naments, 184.
 Tower, J. J., Tools and padlocks, 136.
 Townshend, Mrs. M., Clay, 47; Bricks, 172.
 Toy, Bickford, & Co., Fuses, 111.
 Toyoyasu, Ishimara, 236.
 Traber & Aubery, Iron ores, 15; Car wheels,
 22.
 Tramontino, Cocoons, 224.
 Trapadoux, A. L., Bros., & Co., Foulards, 183.
 Trasel, E. G., Papier maché ware, 139.
 Travaglino, P. J. & W. J. P., Silks, 206.
 Treacy, J., Ales, 157.
 Trebitsch, A., Meerschams, 197.
 Tréfousse & Co., Kid gloves, 183.
 Treloar, G. A., Minerals, 99.
 Tremain, C., Cement, 18; Barrels, 139.
 Tremble, J., Tools, 176.
 Tremont & Suffolk Mills, Cottons, 119.
 Tremouroux, N. & J., Bros., Utensils, 202.

- Tress & Co., Hats, 147.
 Trent Bros., Chicory, 165.
 Trenton Lock and Hardware Co., 137.
 Trichaud, A., Tiles, 180.
 Triestedt, A. W., Chemicals, 211.
 Trigg Furnace, Iron ores, 14; Iron, 22.
 Tripp, J. P., Quartz, 161.
 Triumph Truss Co., 134.
 Trojani, G. B., Bas-relief in baked loaf, 218.
 Tromsdorf, H., Chemicals, 187.
 Tropic Furnace Co., Iron ores, 14; Iron, 22.
 Trouette & Blainfield, Wines, 157.
 Troy Cotton and Woollen Manufactory, 120.
 Troudeau, P., Gas fittings, 173.
 Truffy, Toys, 185.
 Tryon, E. K., jr., Rifles, 133.
 Tschantz, A. J., Parlor organs, 264.
 Tschinkel, A. E., China, 193.
 Tsubaki, Y., Silk, 237.
 Tsuboya, Paper, 239.
 Tsunetaro, Yamao, 236.
 Tucci, Savo Benedetto, Olive oil, 217.
 Tuchfarber, F., & Co., Iron show cards, 137.
 Tucker, Carter, & Co., Bagging, 120; Wire ropes, 139.
 Tucker, H., & Co., Chandeliers, 117.
 Tucker Manuf. Co., Iron furniture, 114.
 Tucuman, Prov. Com. of, Gypsum, 100.
 Tucuman, Province of, Sea salt, 245; Cups, 246; Towels, 248; Caparisons, 250.
 Tugoviz, A., Ore, 66.
 Tukagawa, A., Tukami, S., Tsuji, K., Ted-suka, K., & Co., Porcelain, 237.
 Tula, N., Copper, 101.
 Tull, Glanvill, & Co., Floor coverings, 146.
 Tullesen, P., Machine, 210.
 Tunell, E. A., Iron work, 212.
 Tunxis Mills, Yarns, 123.
 Tuscarawas Coal and Iron Co., 16, 20.
 Turner, J., Yarns, 123; Picture cords, 124.
 Turner, A., & Co., Elastic fabrics, 147.
 Turner, C., & Son, Varnishes, 142.
 Turner, G., & Co., Equipments, 148.
 Turner, R., & Co., Needles, 147.
 Turner & Seymour Mfg. Co., Hardware, 138.
 Turner's Sample Office, Cork articles, 196.
 Turpe, A., Furniture, 188.
 Turnwald, Ch., Leather gloves, 195.
 Twining & Schiedt, Chemicals, 107.
 Tuxen, L. von, Leather, 214.
 Tygert's Valley Mining Co., Iron ore, 14.
 Tyre Vale Chemical Co., 141.
 Tytus Paper Co., 131.
 Tyzich, J., Saw grinder, 176.
 Uddeholme Stock Co., Iron, 85; Ores, 84; Springs, 214; Tools, 214.
 Uebelacker, L., 191.
 Ujhely & Co., H., Wax, 198.
 Ullathorne & Co., Shoe thread, 145.
 Ulbrich, F., Imitation gems, 196.
 Ulrich, H., Glassware, 193.
 Ullman, I. F., Silk laces, 194.
 Unann, J., Flagons, glass articles, 193.
 Underberg, A., Glass, 188.
 Underwood, T., Paints, 150.
 Union Furnace, Iron ores, 14; Iron, 22.
 Union Hardware Co., Skates, 136.
 Union Iron Co., 15, 19.
 Union Manufacturing Co., Doeskins, 122; Hinges, 137.
 Union Metallic Cartridge Co., 132.
 Union Mining Co., 45.
 Union Prospectors Co., 161.
 Union Slate Co., 17.
 Union Wadding Co., 19.
 United States Cartridge Co., 132.
 United States Corset Co., 126.
 Unger, F., Portmonnaies and smoking requisites, 197.
 Uhler, Peter, Ores, 15; Iron, 20.
 United Piano Makers, 264.
 United States Piano Co., 265.
 Union Stone Co., 18.
 Union Steel Screw Co., 137.
 United States Lock Co., 137.
 United Stralsund Playing Card Manufacturing Co., 191.
 United States, 13, 107.
 United Cutters' Society, Furnishing goods, 183.
 Universal Charcoal and Sewage Co.
 Umanu, J., Paper weights, 196.
 University Publishing Co., Books, 261.
 Upham, S. C., Colognes, 110.
 Urech, E., Embroidery, 200.
 U. S. Bunting Co., 122.
 U. S. Corrugated Elbow Co., 20.
 U. S. Manufacturing Co., Inks, 110.
 Usher, R. B., Drugs, 149.
 U. S. Soapstone Manufacturing Co., 19; Gas tips, 117, 130.
 U. S. Spring Bed Co., 114.
 U. S. Steel Shear Co., 136.
 U. S. Salicylic Acid Works, 108.
 Utica Steam Cotton Mills, 119.
 Utschneider & Jaunez, Cements, 230.
 Vachette Bros., Locks, 186.
 Vacquerel, P. E., Porcelain, 180; Decalcomanie, 185.
 Vahey, W., Collars, 178.
 Vaille, E. W., Chairs, 114.
 Vajani, P., Window blinds, curtains, etc., 218.
 Valania, J., Machines, 202.
 Valby, D., Capsules, 186.
 Valdes, E. & C., Stones, 99; Clay, 100.
 Valdes, N., Lime, 100.
 Valdez, E. & C., Productions, 250.
 Valdez, H., Lassos, 249.
 Valckenberg & Schoen, Artificial wool, 190.
 Valensi, M., Pottery and furniture, 227.
 Valensi, M., Shawls, jewelry, arms, and musical instruments, 227.
 Valentine, G., Medicines, 220.
 Valentine & Co., Varnishes, 110.
 Valentine & Butler Safe and Lock Co., 115, 138.
 Valleau, W., jr., Gold and silver leaf, 134.
 Vallini, N., Paper, 220.
 Valló Glass Works, 214.
 Vancouver Coal Co., Sandstones, 46.
 Vancouver Mining Co., 45.
 Vandaume, P. J., Engraving, 204.
 Vamentos-Poelman, G., Shoes, 203.
 Vanderrest, G., Machine, 202.
 Vandervelde, J. S., Powders, 201.
 Vandezande, G., Lace, 204.
 Vanduzen & Tift, Bells, 138.
 Vanoutryve, F., & Co., Coverings, 182.
 Van Aken, L., Carriages, 204.
 Van Alen & Co., Nails, 138.
 Van Arsdale, M. F., Faucets, 138.
 Van Bellinghen, J., Son, Silk, 203.
 Van Bellinghen & Suremont, Silks, 203.
 Van Bergen, A. H., Tiles, 205.
 Van Colker, P. W., Glue, 205.
 Van Damme Bros., Cloth, 203.
 Van Ginderdeuren, Furniture, 202.
 Van Henkelour, H. C., Stone, 205; Screws, 206.
 Van Laer, G., Dyer's guide, 201.
 Van Leer, B., Hangings, 206.
 Van Norman, Judge, Ores, 44.
 Van Skilline, T., Motto papers, 132.
 Van Verschuur & Van der Voort, Stones, 79.
 Van Vliet, W. F., Chairs, 205.
 Van Vollen, G., Human hair, 147.
 Van Wagoner & Williams, Hinges, 138.
 Van Wonkle, Stout, & Co., Coal, 16.
 Van de Loo, J. P. H., Plaster, 206.
 Van den Bergh, N. L. J., Cologne, 205.
 Van der Burgh, A. R. & P., Marbles, 206.
 Van der Burgh, M., Marbles, 206.
 Van der Lugt, G., Furniture, 205.
 Van der Veiden, L., Ink, 201.
 Van der Wynckele Bros. & Alsberge, Thread, 203.
 Vasquez, L., Emeralds, 99.
 Vasseur, Mrs. V., Dresses, 183.

- Vatterlein, J., Hardware, 136.
 Vaucher, L., Oil, 199.
 Vauthier, Mrs., Clothing, 183.
 Vavruska, A., Clothing, 194.
 Vcelicka, A., Kid gloves, 195.
 Vecchiatti, C., Green weed products, 218.
 Veelo, P. J., Cloths, 206.
 Vega, D. de la, Petrification, 99.
 Vegis, Relief work, 225.
 Vehlings & Co., Wire, 204.
 Veltman, J. A., jr., Scarfs, 205.
 Venneman & Co., Iron wire, 60.
 Verdé, Delisle, & Co., Lace, 184.
 Verdé, Delisle Bros., & Co., Lace, 204.
 Vergne & Chose Bros., Instruments, 186.
 Vernay & Van Heusde, Dyes, 205.
 Vessiere, Paulin, J. A., Clothing, 183.
 Vessot, J. & S., Wheel runner, 178.
 Vesuvius Furnace, Iron, 21; Etna Iron Works, 14.
 Vetman, J. A., Scarfs, 205.
 Vettler, J., Wines, 157.
 Viard, F., Perfumery, 180.
 Vicat, J. H., Insect powder, 179.
 Victoria, Mining Dept. of, Coal, 36.
 Victoria, E., Cocoons, 248.
 Victoria Advisory Board, Yarn, 174.
 Victoria, Commissioners' for, Specimens, 35;
 Coal, stone, clay, 36; Chemicals, 153; Flax
 and cocoons, 154; Seeds, 155; Water fowl
 and wheat, 156; Cotton and wools, 157;
 Ferns, fruits, 158.
 Victoria Ladies' Sericulture Co., 154.
 Victoria Mfg. Co., Soaps, 171; Perfumery,
 172; Medicines, 176.
 Victoria, Sub-commission of, Mouldings, 246.
 Vidal, M. A., Ashes, 245.
 Videla, I., Leggings, 248; Harness, 250.
 Videla, R., Paper case, 249.
 Vie. Garnier, & Co., Pharmaceuticals, 186.
 Vigelius, H., Leather, 206.
 Vigiuer, Figaro, Water, 180.
 Vignerón, Charles, Piano insulator, 263.
 Vigers, P., Weapons, 167; Skins, 168.
 Viguier, H., Boots and shoes, 244.
 Vila, C. T. de, Olive oil, 246.
 Villafañe, T., Galena, 99.
 Villa Franca, Baron de, Peat, 97.
 Villard & Co., Velvets, 183.
 Ville de Spa, Trophy furniture, 74.
 Villeroy & Boch, Tiles, 188.
 Villiers, A. B. de, Wines, 169.
 Villiers, A. J. J. de, Wines, 169.
 Villiers, Miss de, Flower articles, 169.
 Vincent Sons, Pavement, 74.
 Vincenzi, P. C., Corks, 220.
 Vinci, M., Shoes, 219.
 Vinos & Rothwell, Buggy, 177; Cutter, 178.
 Vinton Furnace, Iron ores, 14; Iron, 22.
 Violet, Godefroy, & Co., Soaps, 179.
 Viotti, E., Pharmaceuticals, 243.
 Virgili, A. V., Olive oil, 216.
 Violet & Durlach, Oil cloths, 121.
 Visby Match Factory, 211.
 Vital, A., Press rollers, 187.
 Vite, F., Leather, 191.
 Vitry Bros., Cutlery, 186.
 Vo Chon, Vases, incense burners, 234.
 Voeltzkow, W. G., Frames, 189.
 Vogel, G., Glasses, 188.
 Vogel, M. B., Colors, 188.
 Voisin, V. C., Fancy articles, 185.
 Völker, O., Furniture, 188.
 Volstedt, P. J., Preserves, 169.
 Vollmer, G., Furniture, 114.
 Volz-bier, A., Silverware, 190.
 Von Buer, Woolens, 194.
 Von Essen, H. H., Wood work, 212.
 Von Heyden, F., Chemicals, 187.
 Von Harrach, Count, Glass, 193.
 Von Hermansson, Count, Iron, 85.
 Von Stockenström, A., Iron, 85.
 Vorster, R. & H., Tools, 192.
 Vorster & Grunberg, Chemicals, 187.
 Vossen Bros. & L. Vossen & Co., Chemicals,
 187.
 Vulcan Foundry and Mechanical Works, 215.
 Vulcan Mfg. Co., Meat cutters, 117.
 Vulcan Match Mfg. Co., 211.
 Vulcanite Jewelry Co., 127.
 Vraff, Pfeiffer, & Co., Paper material, 204.
 Vran & Co., Thread, 182.
 Vraux & Co., Thread, 182.
 Vreisendorp, H. M., Oils, 205.
 Vyse, R. H., Rawhide rope, 139.
 Wacha, J., Pearl buttons, 197.
 Wade, J. M., Ornaments, 173.
 Wadman, E., Old vases, 233; Old bronzes,
 234.
 Waga, R. M., Chairs, 114; Rugs, 123; Shaker
 articles, 128.
 Wagenmann, G., Petroleum and wax, 193.
 Wagner, John, Stone, 17, 18.
 Wagner, F., Glassware, 193; Bronze articles,
 196.
 Wagner & Starker, Tiles, 189.
 Wahl, E., Fancy bone work, 127.
 Wahlgren, J. E., Dyeing, 211.
 Wahlström, S. F., Furniture, 212.
 Wakefield Rattan Co., 113, 118, 139.
 Waki, Y., Porcelain, 237.
 Wakichio, Tawara, 236.
 Walcker, W., Tents, 182.
 Walcott & Campbell, Cottons, 118.
 Walden Knife Co., 136.
 Waldstein, H., Optics, 263.
 Walén, J., Locks, 214.
 Walker, A., Gas stoves, 153.
 Walker, N. U., Fire clay, 18; Terra cotta, 112.
 Walker, W., Traveling articles, 185.
 Walker, Evans, & Cogswell, Books, 131.
 Walker Glass Importing Co., 116.
 Walker, M., & Sons, Iron gates, 117.
 Walker, R., & Co., Gum, 164.
 Walker, Tucker, & Co., Hand stamps, 130.
 Wallace Bros., Materia medica, 133.
 Wall's W., Sons, Rigging, 139.
 Wallace & Keller, Canes, 127.
 Wallace & Sons, Lamp burners, 117; Wire
 138.
 Wallenstadt Fancy Cotton Goods Mills, 199.
 Wallgren, A. R., Clothing, 212.
 Walling, H. T., Maps, 266.
 Wallis & Co., Leather, 156.
 Walmsley, W. H., Microscopics, 263.
 Walraven, J. E., Decorations, 115.
 Walser, C., Straw goods, 200.
 Walshaw, W., Yarns, 123.
 Walter, G., Smoking requisites, 197.
 Walter von Rohr, A., Combs, 200.
 Walter Heywood Chair Co., 115.
 Walton Bros., Lanterns, 117.
 Walton, E. S., & Co., Hardware, 137.
 Walton, Maison, Bonnets, 126.
 Wampanoag Mills, Cottons, 120.
 Wamsutta Mills, Cottons, 118.
 Wandley, H., Cruet stand, 173.
 Wanamaker & Brown, Clothing, 125.
 Wanamaker, J., & Co., Clothing, 125.
 Wapler, R. H., Cloths, 189.
 Ward & Co., Dumb waiter, 144.
 Ward, A., & Co., Silk threads, 147.
 Ward, M., & Co., Stationery, 148.
 Ward & Payne, Tools, 149.
 Warden & Oxenado, Petroleum, 109.
 Wardle, S., Dental specimens, 134.
 Wardle, T., Artificial teeth, 134.
 Wadalaw, W., Yarns, 174.
 War Department, Danish, Equipments, 212.
 Ware, M. J., Feathers, 109.
 Wargöns Stock Co., Paper, 213.
 Warner, Wm. R., & Co., Pills, 107.
 Warner Bros., Corsets, 125.
 Warnick, Wm., Blank books, 176.
 Warnock, J., & Co., Tools, 176.
 Warren, H. H., Hammers, 176.
 Warren Mfg. Co., Cottons, 119.
 Worrenheim Distillery Co., 157.

- Warthorst & Co., Stone, 17, 18.
 Wartpatrikoff Bros., Powder, 198.
 Washburn, W. E., Lead ore, 40.
 Washburn & Moen, Iron wire, 19.
 Washington Furnace, Iron ores, 14; Iron, 21.
 Washington Mnf. Co., Cottons, 119.
 Washington Mills, Woolens, 122.
 Washington Mills Emery Mnf. Co., 19.
 Watanabe, S., Silk, 239.
 Watcombe Terra Cotta Co., 142.
 Waterbury Button Co., 128.
 Waterbury Brass Co., 23.
 Waterbury Clock Co., Clocks, 262.
 Waterman Bros., Petroleum, 45, 172.
 Waterloo Woolen Mnf. Co., Shawls, 123.
 Waterloo Yeast Co., 107.
 Waters, E., Camp stools, 139.
 Waters, J., Arrowroot, 152.
 Waters, H., & Sons, Organs, 264.
 Waterston, G., & Son, Sealing wax, 148.
 Watkins, Wm. B., Burglar telegraphs, 263.
 Watrigaut, A., Shoes, 283.
 Watson, A., Fleeces, 158.
 Watson Bros., Flour, 152.
 Watson, J. C., Wools, 165.
 Watson, J., & Son, Safes, 115.
 Watson, R. H., Extracts, 111.
 Watson & Baker, Clothing, 174.
 Watson Manufacturing Co., Iron work, 22.
 Watson & Paterson, Hams, 156.
 Wattine, C., & Co., Draperies, 182.
 Watts & Co., Scientific apparatus, 252.
 Waudly, H., Stone, 47.
 Waugaratta, Council of, Photographs, 155.
 Waumbeek Co., Flannels, 122.
 Wauregan Mills, Cottons, 118.
 Wauskuck Co., Woolens, 121.
 Wearne, Capt., Galena, 45.
 Weaver, H. M., Automatic scales, 262.
 Weaver, J. B., Colognes, 111.
 Webb, J. R., Sleigh, 178.
 Webb, Robert, Stove polish, 19.
 Webb, E., & Sons, 146.
 Weber, A., Pianos, 265.
 Weber, J., Wine, 157.
 Weber, O., & Co., Silverware, 190.
 Webley, P., & Son, Firearms, 149.
 Webley Bros., Tweeds, 163.
 Webster, H., Inkstand, 148.
 Webster, N. S., Hematite, 45.
 Webster Mills, Bagging, 120.
 Wechselmann, B., Laces, 190.
 Wedberg, C. H., Ores, 84.
 Weer, I., Machinist work, 177.
 Weetamoe Mills, Cottons, 120.
 Weghorn, J. G., Glass, 188.
 Weichel, M., Horseshoes, 178.
 Weidenbusch & Co., Chemicals, 187.
 Weidman, J., Silks, 124.
 Weidner, J. L. & P., 188.
 Weigert & Co., Plushes, 190.
 Weineck, T., Candles, 192; Perfumery, 193.
 Weishaupt, C. M., & Sons, Silverware, 190.
 Weiskopf, E., Optics, 263.
 Weiss Bros., Cloths, 189.
 Weiss, R., Leather gloves, 195.
 Weiss & Groshmann, Threads, 194.
 Weiss, Feyertag, & Schlenck, 188.
 Welch, Margetson, & Co., Scarfs, 147.
 Welch & Anders, Telegraph Instruments, 263.
 Weldon, W. M., Chlorine, 141.
 Wellenberger, J. & G., Organ, 265.
 Wellington Mining Co., 45.
 Wellmann, F., Cutlery, 192.
 Wellock, J., & Co., Waterproof covers, 146.
 Wells, Charles B., Stone, 17.
 Wells, W., Clay, 47.
 Wells & Hope Co., Metallic cards, 137.
 Welsh, M., Lime, 100.
 Wellston Coal & Iron Co., 22.
 Wellston Twin Furnaces, Iron ores, 14.
 Wenck & Briesen, Fountain, 110.
 Wenck & Co., Perfumes, 110; Atomizers, 112.
 Wendberg & Co., Galvanized work, 177.
 Wendrich & Son, Vases, 209.
 Wendt, F., Cereals, 210.
 Wendt, J. M., Inkstand, 161.
 Wentworth, C. B., & Co., Carpet lining, 123.
 Wengström, J. O., Parts of buildings, 212.
 Werner, J., Clothing, 194.
 Werner, Itschner, & Co., Ribbons, 124.
 Werner & Schumann, Letters, 191.
 Werner, C. O., Oil, 211.
 Wertheim, F., Tool manufacture, 198.
 Wertheimer, J., Fans, 197.
 Wesley, V., Boxes, 197.
 Wesson, F., Rifles, 132.
 West Canada Mining Co., Copper, 48.
 West, C., & Sons, Oils, 109.
 West Bourke Pastoral Society, Wheat, 156.
 Westcott, J. S., Quartz, 161.
 West Cumberland Iron & Steel Co., 29.
 Westerlund, A. F., Peat, 84.
 Western Electric Manufacturing Co., 263.
 Western Meat Preserving Co., 157.
 Western Union Telegraph Co., 263.
 Westerberg, Jefferson, & Co., Embossed Paper, 132.
 Westervicks Match Factory, 211.
 Westland Committee, Woods, 164.
 Westmoreland Coal Co., 16.
 Westnote, R., Earthenware, 173.
 Weston, B.B., Paper, 130.
 Westphalian Union Joint Stock Co., Iron, 60.
 Wethered, E. R., Hammock, 144.
 Wetherell & Bro., White lead, 109.
 Wexelburg & Co., Stove pipe, 173.
 Weybossett Mills, Cassimeres, 121.
 Wharton, Joseph, Nickel ores, 13; Nickel goods, 23.
 Wheeler, M., Chronometer, 262.
 Wheeling Hinge Co., 138.
 Whelpley, J. A., Skates, 176.
 Whitaker & Skirm, Chains, 137.
 White, C. A., Celluloid apparatus, 134.
 White, Charles T., & Co., Chemicals, 108.
 White, D., Safety hook, 155.
 White, G., Wines, 162.
 White, George H., Pepsin, 107.
 White, H. A., Damper, 173.
 White, J. J., Potash, 141.
 White, Otis C., Head rests, 113.
 White, S. S., Dental instruments, 134.
 White, Samuel S., Telegraphs, 263.
 White, W. G., Lock, 149.
 White Lead & Iron Paint Co., 201.
 Whitehead, I., Painting, 154.
 Whitehead & Turner, Brushes, 177.
 Whitelaw, E. H., Quartz, 161.
 Whiteside, H., & Co., Beds, 173.
 Whiting Paper Co., 130.
 Whitmore, Robinson, & Co., Stoneware, 112.
 Whitney, H. M., Corals, "Gazette," 242.
 Whitner Bros., Chemicals, 112.
 Whitney Arms Co., Firearms, 132.
 Whitney Mfg Co., Tools, 136; Chairs, 115.
 Whitson & Slater, Limestone, 46.
 Whittier, R. S., Screens, 116.
 Whittenton Manufacturing Co., Cottons, 120.
 Wiberg, M., Range, 212.
 Wiegman, A., Basket ware, 153.
 Wienbelt, W., Boots, 206.
 Wielander, P., Pearl buttons, 197.
 Wiese Bros., Cloths, 189.
 Wiessner, J. G., & Bubb, 188.
 Wigan Coal & Iron Co., 29.
 Wihl, M., & Co., Cloth, 203.
 Wike, B., Clothing, 200.
 Wiklund, W., Brass work, 214.
 Wickström, J. A., Iron, 85; Nails, 214.
 Wilcox, W., Locks, 138.
 Wiler, W., Gas torches, 117; Stair rods, 137.
 Wild, ix., J. C., Agates, 190.
 Wild, G. L., & Bro., Toys, 128.
 Wild, J., Velveteens, 145.
 Wild, J., & Co., Mats, 118.
 Wild & Co., 191.
 Wilder, H., Hair, 242.

- Wilder, S. G., 241.
 Wildman, L. P., Violins, 265.
 Wilford, W., Flax, 203.
 Wilhelm & Newman, Cast iron work, 117.
 Wilhelm, A., Reflectors, 117.
 Wilhelmi, F., 188.
 Wilhelm, F., & Co., Drugs, 198.
 Wilke, H., & Co., Barks, 163.
 Wilkins, R., Seeds, 164.
 Wilkström, J. A., Ores, 84.
 Will & Finck, Cutlery, 136.
 Willemsen, P., Widow, Cottons, 189.
 Willems, P. J., Oils, 205.
 Willett, G., Photographs, 155.
 Willett, S. T., Flannels, 174.
 Williams, Charles, Marble work, 17.
 Williams, C. E., Shell case, 242; Canes, 242.
 Williams, S. B., & Co., Soaps, 108.
 Williams, M., Gas carburetter, 142.
 Williams, R. L., Slate, 18.
 Williams, E. G., & Co., Textile fabrics, 146.
 Williams, E. M., & Co., Tinware, 173.
 Williams, Marble & Slate Mantle Co., 27.
 Williams, Page, & Co., Lamps, 117.
 Williamson, W., & Orbeton, Hinges, 139.
 Williams & Powell, Guns, 149.
 Wills, E. S., Tools, 136.
 Willis, A. L., Fuses, 132; Fog signals, 111;
 Ice creeper, 136; Rubber rails, 139; Octave
 coupler, 265.
 Willis, E., & Co., Paper collars, 175.
 Willson, T. A., & Co., Optics, 263.
 Windspach, E., Cream of tartar, 192.
 Wilson, A., Coals, 167.
 Wilson, A. D., Scotch jewelry, 127.
 Wilson, J., Canes, 127; Wool, 158; Soups,
 172.
 Wilson, B. O. & G. C., Herbs, 133.
 Wilson, J. Co., Paper bags, 176.
 Wilson, J. H., Military goods, 125; Regalias,
 139.
 Wilson, J. M., Bridges, 265.
 Wilson, Sir S., Photographs, 155; Wools,
 158.
 Wilson, T., Leather, 165.
 Wilson, W., Limestone, 40.
 Wilson, Hinkle, & Co., Books, 260.
 Wilson & Hughes Stone Co., 18.
 Wilson & Miller, Mantels, 17.
 Wilson, Gilmour, & Co., Mantels, 174.
 Wilson, Parsons, & Co., Monuments, 139.
 Wilson, Walker, & Co., Car forgings, 20.
 Wiman & Co., Range, 212.
 Weimmer, W., Wirework, 189.
 Winch, Corydon, Iron spikes, 20.
 Winchester, G. C., Chairs, 115.
 Winchester Repeating Arms Co., 132.
 Wing & Rill, Stringless piano forte, 264.
 Wingender Bros., Pipes, 191, 201.
 Winkler, A., Zinc articles, 198; Oleographs,
 198.
 Winkler, C., Silverware, 190; Metal signs,
 198.
 Winn, H., Key locks, 138.
 Winning, Hill, & Ware, Waters, 48.
 Winslow, S., Skates, 136.
 Winterthur Silk Goods Factory, 200.
 Wintes, W., Pearl buttons, 197.
 Wire & Screw Factory, 192.
 Wirmand, F., Insects, 245.
 Wirth, C. F., Leather articles, 197.
 Wise, G., Saltpetre, 167.
 Wisconsin, State of, Educational, 258.
 Wiskott, C. T., Labels, 191.
 Wiss, J., Cutlery, 136.
 Wissen Joint Stock Co., Metals, 90.
 Witek, A., Pearl buttons, 197.
 Witteveen, G., Terra cotta, 205.
 Witherbee, Sherman, & Co., Iron ore, 13.
 Witty, C., Cannon, 132.
 Woagant, H. S., Shades, 174.
 Wöhler, E., Silverware, 190.
 Wolf, S., Shoe materials, 190.
 Wolf Bros. & Keech, Essential oils, 111.
 Wölfel & Herold, Gravestones, 60.
 Wolff, F., Cottons, 189.
 Wolff & Son, 188.
 Wolff, F. A., & Sons, Pharmaceutics, 192.
 Woller, F. E., Hosiery, 190.
 Wood, J., The Sea Side Oracle, 260.
 Wood Bros., Drain tiles, 111.
 Wood, W. D., Wheat, 164.
 Wood, Alan, & Co., Iron, 19.
 Wood & Haslam, Yarn & quilts, 123.
 Wood, W., & Co., Cottons & woollens, 123.
 Wood, Wm., & Co., Books, 260.
 Wood, W. D., & Co., Iron, 19.
 Wood, T. M., & Co., Blinds, 174.
 Wood & Ivery, Bricks, 142.
 Wood, Morrell, & Co., Cassimeres, 122.
 Woodcock, F., Porcelains, 180; Porcelain
 flowers, 184.
 Woodfield, W., & Sons, Needles, 148.
 Woodley, J. A., Boots, 165.
 Woodruff, E. W., File holders, 129.
 Woodruff, J., Sleeping car, 267.
 Woods, J. T., Splints, 133.
 Woods, G., & Co., Organs, 264.
 Woods, Sherwood, & Co., Wire ware, 137.
 Woodstock Iron Co., 15, 20.
 Woodward, G., Guano, 153.
 Woodworth, A. L., Yarns, 174; Cotton
 yarns, 174.
 Woodworth, C. B., Cosmetics, 111.
 Woolen Mnfg. Co., 174.
 Woolen Mnfy. of Borgo Sesia, Worsted,
 wool, 218.
 Woolley, G. W., Pen, 129; Gynæcological
 apparatus, 135.
 Woon, R. W., Ornaments, 163; Weapons
 164.
 Wooton Desk Co., 114.
 Woovehead, G., Sideboard, 173.
 Worcester Corset Co., 125.
 Workman, H., Clay, 47; Bricks, 172.
 Worrell Bank Lock Manufacturing Co., 138.
 Worsted Mills, 190.
 Worsley, Thos., & Co., Soaps, 111.
 Wortendyke Manufacturing Co., Wicks, 120.
 Worthington & Co., Marble, 46.
 Worthington & Sons, Stone, 18.
 Worumbo Manufacturing Co., Woollens, 121.
 Wouldham Cement Co., 29.
 Woven Wire Web Bed Co., 113.
 Woven Wire Mattress Co., 118.
 Wright, E. W., Wines, 163.
 Wright, W. P., Oiled silks, 124.
 Wright, J. K., & Co., Printing inks, 110.
 Wright, R. & G. A., Cosmetics, 111.
 Wright, Davenport, & Co., Leather, 151.
 Wright & Mansfield, Furniture, 144.
 Wright, Moore, & Co., Chairs, 115.
 Wright, Payne, & Co., Jams, 156.
 Wrigley, Wm., & Co., Soap, 108.
 Wushanghai, Gauzes, 233.
 Wüflinger, Mach. Embr'y Establishm't, 200.
 Wurff bain, G., Herbarium, 250.
 Wurfflein, W., Parlor rifles, 133.
 Wurn, F., Silk, 163.
 Wurth, G., Leather articles, 197.
 Wurtz's, Th., successors, Chemicals, 187.
 Wuste, F., Colors, 193; Cylinder coverings,
 193.
 Wyeth, John, & Bro., Drugs, 107.
 Wyndham, F., Spirit of eggs, 141.
 Wyndham, G., Wines, 152.
 Windham, W., Wines, 152.
 Wyoming Historical & Geological Society,
 13.
 Yale Lock Mfg. Co., 137; Nickel plating, 263.
 Yamada, D., Straw work, 239.
 Yamafoto, S., Silk, 239.
 Yamamoto, H., Lacquer work, 239.
 Yamamoto, Y., Wood & bamboo work, 239.
 Yates, Bennett, & Allen, Crockery, 112.
 Yates, Wharton, & Co., Felt hats, 126.
 Yandell & Co., Leather chairs, 114.
 Yerkes & Plumb, Tools, 135.

- Yoni Yama, T., Cotton cloth, 239.
 Yomo, Y., Bronzes, 238.
 Yorimichi, Saigo, 236.
 York Manufacturing Co., Cottons, 120.
 York Street Flax Spinning Co., 145.
 Yosamba Silk Association, Silk, 237.
 Yoshitaka, Ishii, 236.
 Yoshida, K., Papers, 238.
 Yoshio, Tanaka, 236.
 Yoshida, Y., Bronzes, 238.
 Yoshioka, S., Grape, 239.
 Young, C. B., Wheat, 162.
 Young, J. K., Soda, 141.
 Young, Mrs., Mosses & shells, 242.
 Young's, W. J., Sons, Astronomics, 262.
 Young, Ladd, & Coffin, Perfumes, 111; Atom-
 izers, 112.
 Youngs, W., & Sons, Crockery, 112.
 Young, Y. & J., Limestone, 46.
 Ystada Match Mnf. Co., 211.
 Zaalberg, J., Covers, 205.
 Zacherl, J., Tinctures, 198; Sponges, 198.
 Zadig, N., Perfumery, 211.
 Zætlein & Müller, Argal, 199.
 Zähler & Schiess, Edgings, 200.
 Zalaffi, B., Iron work, 220.
 Zambach's Successors, F., Pearl buttons, 197.
 Zander, G. M., Gymnastics, 213.
 Zaranelli Committee, Lignite, 40.
 Zaranki, Committee, Clay, 40.
 Zasche, J., China, 193; Porcelain, 193.
 Zäuner, H., Lace caps, 125.
 Zbuiden, F., Anti-oxyd, 70.
 Zech, H., Furniture, 202.
 Zekert, J., Bronze, 196.
 Zellweger, J. C., Embroidery, 200.
 Zentmayer, J., Microscopes, 263.
 Zeuner, H., Silverware, 190.
 Ziegele, C., Hauck, 191.
 Ziekert, J., Glassware, 193.
 Zieher, O., Silverware, 190.
 Ziegler's Son, Blown plate glass, 193.
 Zindars, C. E., Signals, 149.
 Zimmermann, E. G., Silverware, 190.
 Zimmerman, O., Tiles, 60.
 Zimnier & Co., Stassfurt, 60.
 Zinc Roofing & Ornamenting Works, 140.
 Zinsser, W., & Co., Varnishes, 110.
 Zobel, C. F. J., Metal work, 144.
 Zoological & Acclimatization Society, 154.
 Zorilla, B., Silver, 101, 247.
 Zorn, E., Sauces, 156.
 Zsigmondy, A., Teeth, 198.
 Zuparana, Baron de, Calcareous spar, 97.

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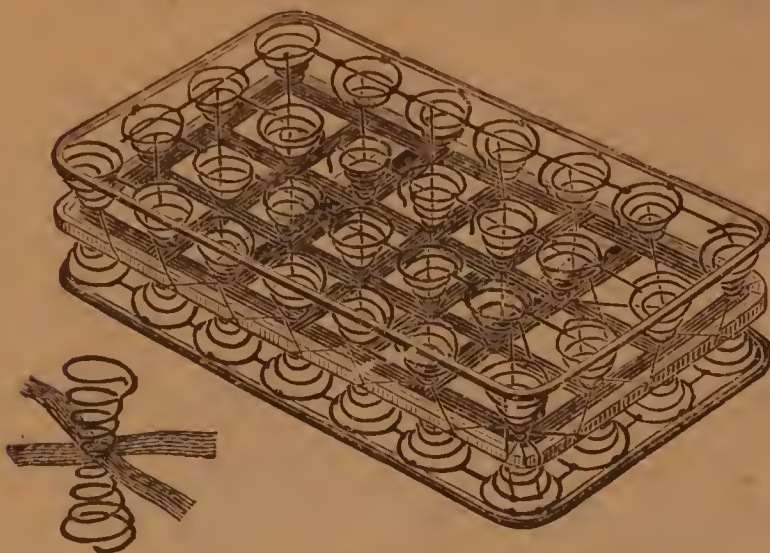
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Solicitor.

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Publishing and Advertising Manager,

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UNITED STATES CENTENNIAL COMMISSION.

INTERNATIONAL EXHIBITION,
1876.

OFFICIAL CATALOGUE

pt. III
Dept. A
DEPARTMENT OF MACHINERY.

PHILADELPHIA :
PUBLISHED BY JOHN R. NAGLE AND COMPANY,
PRINTED AT THE RIVERSIDE PRESS, CAMBRIDGE, MASS.

3
1876.



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MACHINERY HALL.

UNITED STATES CENTENNIAL COMMISSION.

INTERNATIONAL EXHIBITION,

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OFFICIAL CATALOGUE

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CONTENTS.

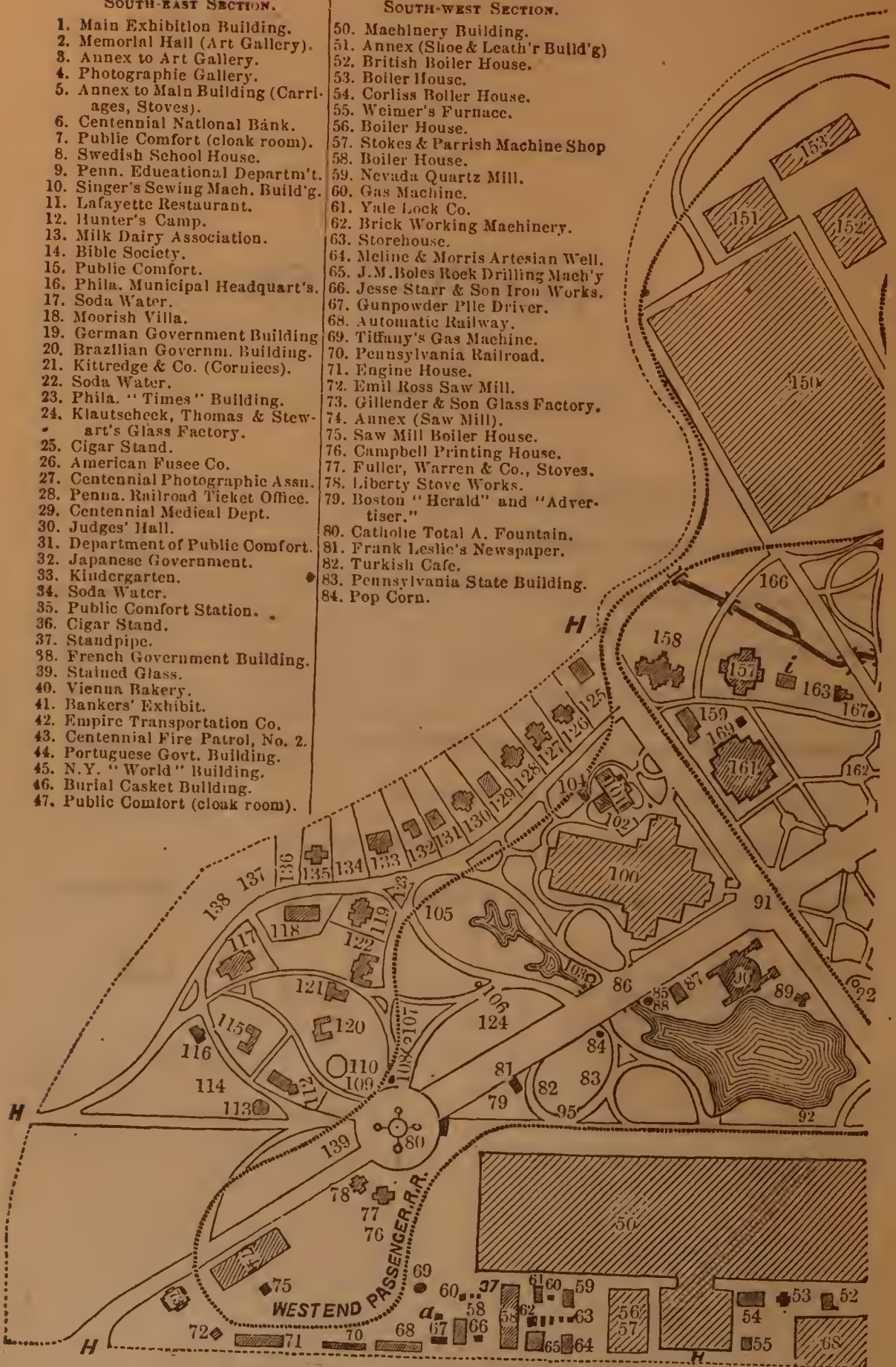
Plan of Exhibition Grounds,	6
Subject index, National exhibits,	8
The Machinery Building,	9
Key to the Notation,	10
Synopsis of the Classification,	12
Classification of the Department of Machinery,	13
Catalogue of the Department of Machinery,	17
Descriptions and Catalogues of Special Buildings,	56
Alphabetical index of Exhibitors in Department V and Special Buildings, . . .	101

SOUTH-EAST SECTION.

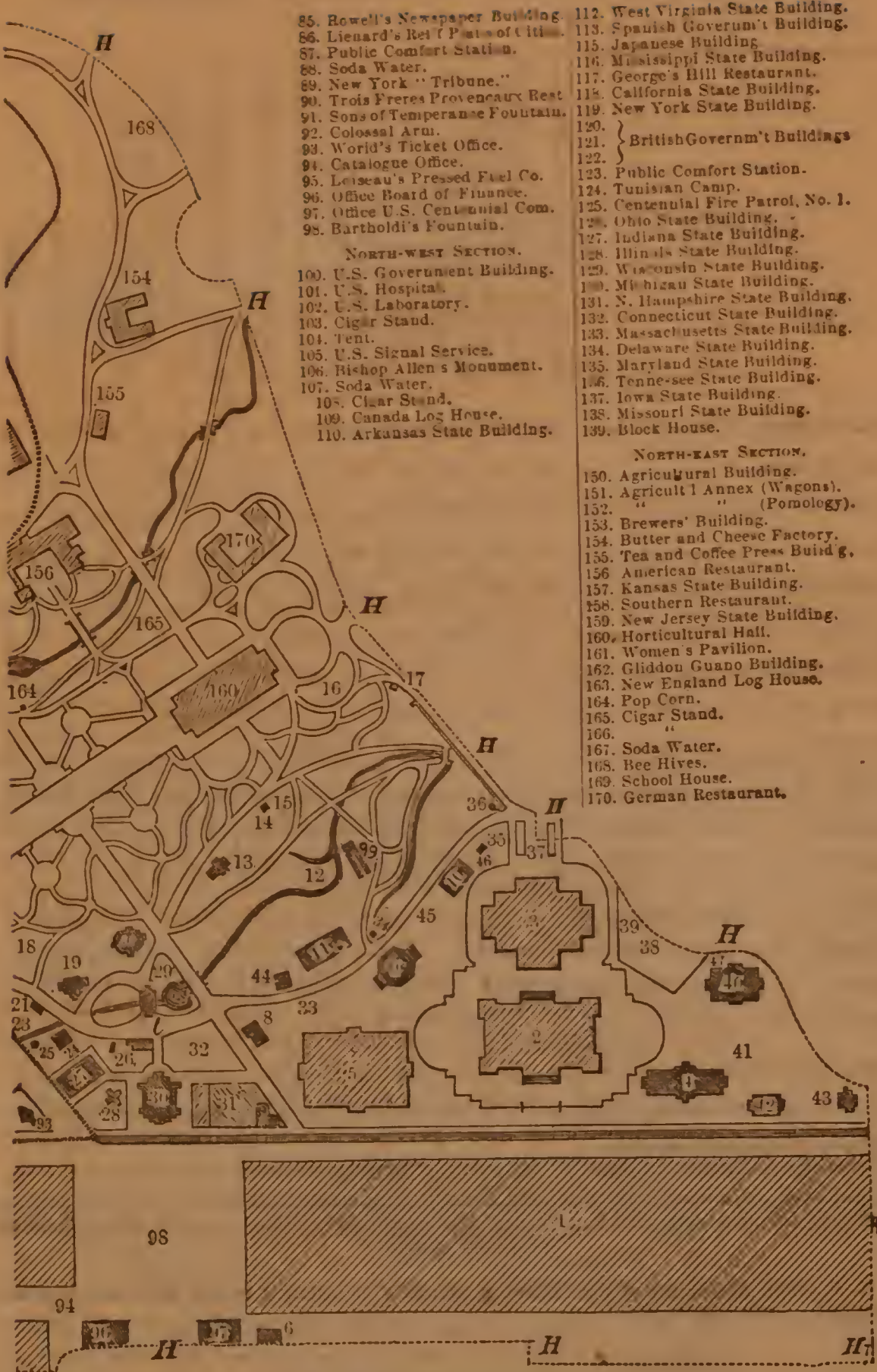
1. Main Exhibition Building.
2. Memorial Hall (Art Gallery).
3. Annex to Art Gallery.
4. Photographic Gallery.
5. Annex to Main Building (Carriages, Stoves).
6. Centennial National Bank.
7. Public Comfort (cloak room).
8. Swedish School House.
9. Penn. Educational Departm't.
10. Singer's Sewing Mach. Build'g.
11. Lafayette Restaurant.
12. Hunter's Camp.
13. Milk Dairy Association.
14. Bible Society.
15. Public Comfort.
16. Phila. Municipal Headquart's.
17. Soda Water.
18. Moorish Villa.
19. German Government Building.
20. Brazilian Governm. Building.
21. Kittredge & Co. (Cornices).
22. Soda Water.
23. Phila. "Times" Building.
24. Klautscheck, Thomas & Stewart's Glass Factory.
25. Cigar Stand.
26. American Fusce Co.
27. Centennial Photographic Assn.
28. Penna. Railroad Ticket Office.
29. Centennial Medical Dept.
30. Judges' Hall.
31. Department of Public Comfort.
32. Japanese Government.
33. Kindergarten.
34. Soda Water.
35. Public Comfort Station.
36. Cigar Stand.
37. Standpipe.
38. French Government Building.
39. Stained Glass.
40. Vienna Bakery.
41. Bankers' Exhibit.
42. Empire Transportation Co.
43. Centennial Fire Patrol, No. 2.
44. Portuguese Govt. Building.
45. N.Y. "World" Building.
46. Burial Casket Building.
47. Public Comfort (cloak room).

SOUTH-WEST SECTION.

50. Machinery Building.
51. Annex (Shoe & Leath'r Build'g)
52. British Boiler House.
53. Boiler House.
54. Corliss Boiler House.
55. Weimer's Furnace.
56. Boiler House.
57. Stokes & Parrish Machine Shop
58. Boiler House.
59. Nevada Quartz Mill.
60. Gas Machine.
61. Yale Lock Co.
62. Brick Working Machinery.
63. Storehouse.
64. Meline & Morris Artesian Well.
65. J.M. Boles Rock Drilling Mach'y
66. Jesse Starr & Son Iron Works.
67. Gunpowder Pile Driver.
68. Automatic Railway.
69. Tiffany's Gas Machine.
70. Pennsylvania Railroad.
71. Engine House.
72. Emil Ross Saw Mill.
73. Gillender & Son Glass Factory.
74. Annex (Saw Mill).
75. Saw Mill Boiler House.
76. Campbell Printing House.
77. Fuller, Warren & Co., Stoves.
78. Liberty Stove Works.
79. Boston "Herald" and "Advertiser."
80. Catholic Total A. Fountain.
81. Frank Leslie's Newspaper.
82. Turkish Cafe.
83. Pennsylvania State Building.
84. Pop Corn.



GROUND PLAN OF THE



- 85. Rowell's Newspaper Building.
- 86. Lienard's Ref. Plant of City.
- 87. Public Comfort Station.
- 88. Soda Water.
- 89. New York "Tribune."
- 90. Trois Freres Provencaux Rest.
- 91. Sons of Temperance Fountain.
- 92. Colossal Arm.
- 93. World's Ticket Office.
- 94. Catalogue Office.
- 95. Lenseau's Pressed Fuel Co.
- 96. Office Board of Finance.
- 97. Office U.S. Centennial Com.
- 98. Bartholdi's Fountain.

NORTH-WEST SECTION.

- 100. U.S. Government Building.
- 101. U.S. Hospital.
- 102. U.S. Laboratory.
- 103. Cigar Stand.
- 104. Tent.
- 105. U.S. Signal Service.
- 106. Bishop Allen's Monument.
- 107. Soda Water.
- 108. Cigar Stand.
- 109. Canada Log House.
- 110. Arkansas State Building.

- 112. West Virginia State Building.
- 113. Spanish Government Building.
- 115. Japanese Building.
- 116. Mississippi State Building.
- 117. George's Hill Restaurant.
- 118. California State Building.
- 119. New York State Building.

- 120. } British Governm't Buildings
- 121. }
- 122. }
- 123. Public Comfort Station.
- 124. Tunisian Camp.
- 125. Centennial Fire Patrol, No. 1.
- 126. Ohio State Building.
- 127. Indiana State Building.
- 128. Illinois State Building.
- 129. Wisconsin State Building.
- 130. Michigan State Building.
- 131. N. Hampshire State Building.
- 132. Connecticut State Building.
- 133. Massachusetts State Building.
- 134. Delaware State Building.
- 135. Maryland State Building.
- 136. Tennessee State Building.
- 137. Iowa State Building.
- 138. Missouri State Building.
- 139. Block House.

NORTH-EAST SECTION.

- 150. Agricultural Building.
- 151. Agricultural Annex (Wagons).
- 152. " " (Pomology).
- 153. Brewers' Building.
- 154. Butter and Cheese Factory.
- 155. Tea and Coffee Press Building.
- 156. American Restaurant.
- 157. Kansas State Building.
- 158. Southern Restaurant.
- 159. New Jersey State Building.
- 160. Horticultural Hall.
- 161. Women's Pavilion.
- 162. Glidden Guano Building.
- 163. New England Log House.
- 164. Pop Corn.
- 165. Cigar Stand.
- 166. " "
- 167. Soda Water.
- 168. Bee Hives.
- 169. School House.
- 170. German Restaurant.

INTERNATIONAL EXHIBITION.

SUBJECT INDEX, NATIONAL EXHIBITS.

NATIONS.	Machines, Tools, etc., of Mining, Chemistry, etc.	Machines and Tools for Working Metal, Wood, and Stone.	Machines and Implements of Spinning, Weaving, etc.	Machines, etc., used in Sewing, Making Clothing, etc.	Machines for Printing, Making Books, Paper-making.	Motors, Power Generators, etc.	Hydraulic and Pneumatic Apparatus.	Railway Plant, Rolling-Stock, etc.*	Machinery used in Preparing Agricultural Products.	Aërial, Pneumatic, and Water Transportation.	Special Buildings.	Women's Work.
United States.....	17	18	23	24	26	27	32	35	37	38	56	80
Great Britain.....	40	40	40	41	41	41	41	42	42	42	95	...
Canada.....	42	42	43	43	43	43	44	44	45	45	94	...
France.....	46	46	46	46	46	47	47	47	47	48	89	84
Germany.....	48	48	48	48	48	48	49	49	...	49	86	...
Austria.....	49	...	49	...	...	49	...	49	49	...	...	...
Switzerland.....	...	...	...	...	...	49	...	49	...	...	...	...
Belgium.....	50	50	50	50	50	50	50	50	...	...	...	...
Netherlands.....	...	51	...	51	...	51	51	...	...	...	...	84
Sweden.....	51	51	...	51	51	52	52	52	...	52	85	84
Norway.....	...	...	52	...	...	52	52	...	...	52	...	...
Italy.....	53	...	53	...	53	53	53	...	53	53	...	...
Spain.....	...	...	...	...	...	...	...	...	...	{	94	...
Portugal.....	...	...	...	...	...	...	...	...	...		95	...
Japan.....	...	...	...	...	...	...	...	...	...	{	88	...
Brazil.....	...	...	...	...	...	54	54	...	...		95	...
Argentina Republic.....	...	...	...	54	54	...	...	54	...	54	...	...
United States Government.....	...	...	...	...	...	...	...	...	...	...	65	...
Women's Centennial Executive Committee.....	...	...	...	...	...	...	...	...	...	...	79	...

* Railway-plant, cars, etc., are largely exhibited in the Annex (No. 5) to the Main Building, catalogue, page 300.

N. B.—The Machinery of the following countries is installed in the Main Building, and catalogued in that volume, viz.:

	Page.
Victoria.....	155
Denmark.....	210
New South Wales.....	270
Switzerland.....	286

MACHINERY HALL. No. 50.

Size, 360 by 1402 feet; annex, 208 by 210 feet.

Engineers and Architects, HENRY PETTIT, JOSEPH M. WILSON, *Philadelphia*.

Contractor, PHILIP QUIGLEY, *Wilmington, Del.*

Wrought and cast iron furnished by PUSEY, JONES, & CO., *Wilmington, Del.*

MACHINERY HALL is located west of the intersection of Belmont and Elm avenues, at a distance of 542 feet from the west front of the Main Exhibition Building, and 274 feet from the north side of Elm avenue. The north front of the building is upon the same line as that of the Main Exhibition Building, thus presenting a frontage of 3824 feet from the east to the west ends of the exhibition buildings upon the principle avenue within the grounds.

The principal portion of the structure is one story in height, showing the main cornice upon the outside at 40 feet from the ground, the interior height to the top of the ventilators in the avenues being 70 feet, and in the aisles 40 feet. To break the long lines upon the exterior, projections have been introduced upon the four sides, and the main entrances finished with facades, extending to 78 feet in height. The east entrance forms the principal approach from street-cars, from the Main Exhibition Building, and from the Pennsylvania Railroad depot. Along the south side are the boiler houses and other buildings for special kinds of machinery. The west entrance affords the most direct communication with George's Hill, which point affords the best view of the entire exhibition grounds.

The arrangement of the ground plan shows two main avenues 90 feet wide by 1360 feet long, with a central aisle between, and an aisle on either side. Each aisle is 60 feet in width; the two avenues and three aisles making the total width of 360 feet. At the centre of the building is a transept of 90 feet in width, which at the south end is prolonged beyond the Main Hall. This transept, beginning at 36 feet from the Main Hall and extending 263 feet, is flanked on either side by aisles of 60 feet in width, and forms the annex for hydraulic machines. The promenades in the avenues are 15 feet in width, in the transept 25 feet, and in the aisles 10 feet. All other walks extending across the building are 10 feet in width, and lead at either end to exit doors.

The foundations consist of piers of masonry. The superstructure consists of solid timber columns supporting roof trusses, constructed with straight wooden principals and wrought iron ties and struts. As a general rule, the columns are placed lengthwise of the building, at the uniform distance apart of 16 feet. The columns are 40 feet high to the heel block of the 90 feet span roof trusses over the avenues, and they support the heel of the 60 feet spans over the aisles at the height of 20 feet. The outer walls are built of masonry to a height of five feet, and above that are composed of glazed sash placed between the columns. Portions of the sash are movable

for ventilation. Louvre ventilators are introduced in continuous lengths over both the avenues and the aisles. The building is lit entirely by side light.

The motive power is furnished by a Corliss engine of 1400 horse power. There are eight main lines of shafting, extending almost the entire length of the structure, and countershafts are introduced into the aisles where needed. The hangers are attached at the height of 20 feet from the floor.

The annex for hydraulic machines contains a tank 60 feet by 160 feet, with depth of water of 10 feet. In this hydraulic machinery is exhibited in full operation. At the south end of this tank is a waterfall 35 feet high by 40 feet wide, supplied from the tank by the pumps upon exhibition.

The contract in the erection of Machinery Hall was made January 27th, 1875, and the building was begun forthwith, and finished October 1st, 1875. The cost was \$542,300. The exhibition area covers about 14 acres.

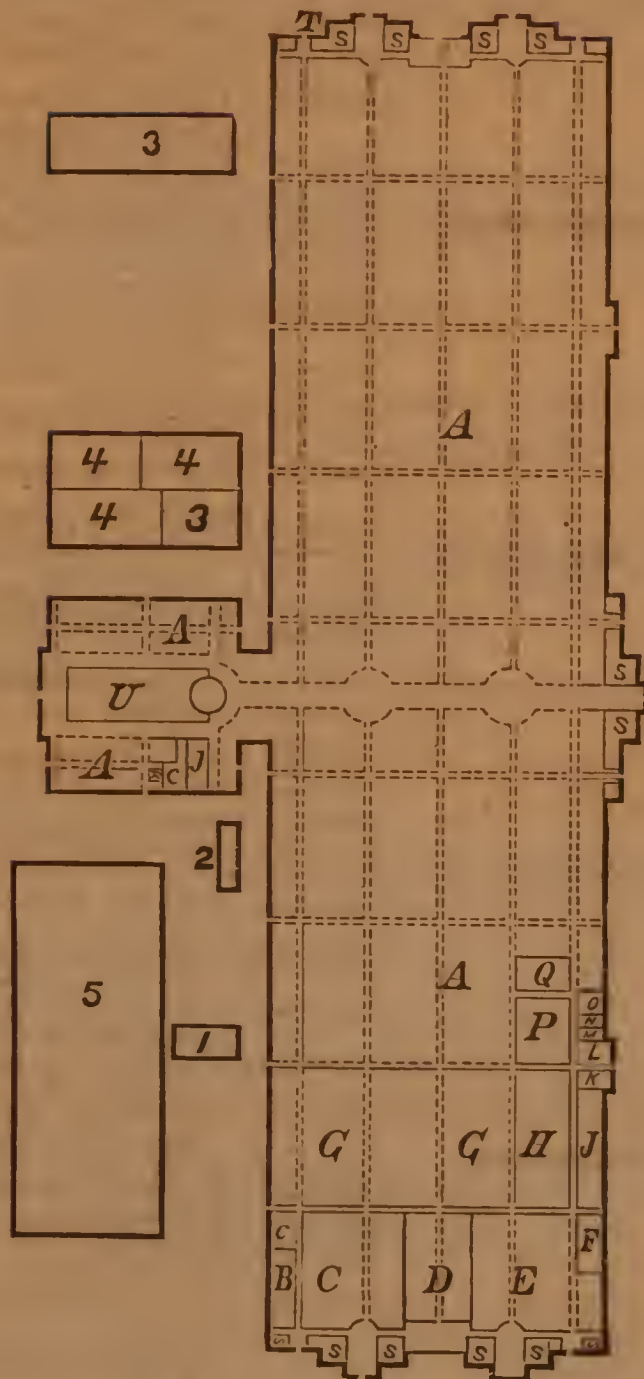
KEY TO THE NOTATION.

THE location of objects in the Machinery Building is shown by a letter and figure, indicating the nearest column of the building. The letters—A, B, C, to F—designate the successive ranges of columns, proceeding northward from the southern wall across the width of the building; the figures, the number of the column in each range, counting westwardly from the eastern wall, the entire length of the building, from 1 to 88. Thus C 5 is the column in the third range from the south, and the fifth from the eastern end of the building. The northwesternmost column is F 88.

The class of the classification to which each exhibit belongs is indicated by the small figures at the end of the line.

MACHINERY HALL.

Scale, 320 ft. to 1 in.



- | | |
|------------------|----------------------------|
| A United States. | O Argentine Confederation. |
| B Austria. | P Brazil. |
| C German Empire. | Q Russia. |
| D Canada. | R Switzerland. |
| E France. | S Restaurants, etc. |
| F Spain. | T Ladies' Waiting-room. |
| G Great Britain. | U Tank. |
| H Belgium. | 1. English Boiler-house. |
| I Sweden. | 2. Corliss Boiler-house. |
| K Denmark. | 3. Boiler-houses. |
| L Italy. | 4. Machine Shop and Annex. |
| M Chili. | 5. Shoe and Leather Shop. |
| N Norway. | |

Length, 1402 ft. Width, 360 ft. Height of Avenues, 70 ft. Height of Aisles, 40 ft.

SYNOPSIS OF THE CLASSIFICATION.

LOCATION.	DEPARTMENTS.	CLASSES.	GROUPS.
MAIN BUILDING.	I. MINING AND METALLURGY.	100—109	Minerals, Ores, Stone, Mining Products.
		110—119	Metallurgical Products.
		120—129	Mining Engineering.
	II. MANUFACTURES.	200—205	Chemical Manufactures.
		206—216	Ceramics, Pottery, Porcelain, Glass, etc.
		217—227	Furniture, etc.
		228—234	Yarns and Woven Goods of Vegetable or Mineral Materials.
		235—241	Woven and Felted Goods of Wool, etc.
		242—249	Silk and Silk Fabrics.
		250—257	Clothing, Jewelry, etc.
		258—264	Paper, Blank Books, Stationery.
		265—271	Weapons, etc.
		272—279	Medicine, Surgery, Prothesis.
		280—284	Hardware, Edge Tools, Cutlery, and Metallic Products.
	III. EDUCATION AND SCIENCE	285—291	Fabrics of Vegetable, Animal, or Mineral Materials.
		292—296	Carriages, Vehicles, and Accessories.
		300—309	Educational Systems, Methods, and Libraries.
		310—319	Institutions and Organizations.
		320—329	Scientific and Philosophical Instruments and Methods.
		330—339	Engineering, Architecture, Maps, etc.
		340—349	Physical, Social, and Moral Condition of Man.
	IV. ART.	400—409	Sculpture.
		410—419	Painting.
		420—429	Engraving and Lithography.
		430—439	Photography.
		440—449	Industrial and Architectural Designs, etc.
		450—459	Ceramic Decorations, Mosaics, etc.
MACHINERY BUILDING.	V. MACHINERY.	500—509	Machines, Tools, etc., of Mining, Chemistry, etc.
		510—519	Machines and Tools for working Metal, Wood, and Stone.
		520—529	Machines and Implements of Spinning, Weaving, etc.
		530—539	Machines, etc., used in Sewing, Making Clothing, etc.
		540—549	Machines for Printing, Making Books, Paper Working, etc.
		550—559	Motors, Power Generators, etc.
		560—569	Hydraulic and Pneumatic Apparatus.
		570—579	Railway Plant, Rolling Stock, etc.
		580—589	Machinery used in Preparing Agricultural Products.
		590—599	Aerial, Pneumatic, and Water Transportation.
			Machinery, and Apparatus, especially adapted to the requirements of the Exhibition.
AGRICULTURAL BUILDING.	VI. AGRICULTURE.	600—609	Arboriculture and Forest Products.
		610—619	Pomology.
		620—629	Agricultural Products.
		630—639	Land Animals.
		640—649	Marine Animals, Fish Culture, and Apparatus.
		650—662	Animal and Vegetable Products.
		665—669	Textile Substances of Vegetable or Animal origin.
		670—679	Machines, Implements, and Processes of Manufacture.
		680—689	Agricultural Engineering and Administration.
		690—699	Tillage and General Management.
	VII. HORTICULTURE.	700—709	Ornamental Trees, Shrubs, and Flowers.
		710—719	Hot Houses, Conservatories, Graperies.
		720—729	Garden Tools, Accessories of Gardening.
		730—739	Garden Designing, Construction, and Management.

CLASSIFICATION.

DEPARTMENT V.—MACHINERY.

MACHINES, TOOLS, AND APPARATUS OF MINING, METALLURGY, CHEMISTRY, AND THE EXTRACTIVE ARTS.

CLASS 500.—Rock drilling.

CLASS 501.—Well and shaft boring.

CLASS 502.—Machines, apparatus, and implements for coal cutting.

CLASS 503.—Hoisting machinery and accessories.

CLASS 504.—Pumping, draining, and ventilating.

CLASS 505.—Crushing, grinding, sorting, and dressing. Breakers, stamps, mills, pans, screens, sieves, jigs, concentrators.

CLASS 506.—Furnaces, smelting apparatus, and accessories.

CLASS 507.—Machinery used in Bessemer process.

CLASS 508.—Chemical manufacturing machinery. Electroplating. Paint and powder mills. Blacking and soap-making machinery.

CLASS 509.—Gas machinery and apparatus.

MACHINES AND TOOLS FOR WORKING METAL, WOOD, AND STONE.

CLASS 510.—Planing, sawing, veneering, grooving, mortising, tonguing, cutting, moulding, stamping, carving, and cask-making machines, etc., cork-cutting machines.

CLASS 511.—Direct acting steam sawing machines, with gang saws. Bark mills.

CLASS 512.—Rolling mills, bloom squeezers, blowing fans. Rivet, nail, bolt, and tack making machinery.

CLASS 513.—Furnaces and apparatus for casting metals, with specimens of work.

CLASS 514.—Steam, trip, and other hammers, with specimens of work, anvils, forges, bellows.

CLASS 515.—Planing, drilling, slotting, turning, shaping, punching, stamping, cutting, and coining machines. Wheel cutting and dividing machines, emery wheels, drills, taps, gauges, dies, etc. Grindstones.

CLASS 516.—Stone-sawing and planing machines, dressing, shaping, and polishing, sand blasts, Tilghman's machines, glass-grinding machines, etc.

CLASS 517.—Brick, pottery, and tile machines. Machines for making artificial stone.

CLASS 518.—Furnaces, moulds, blowpipes, etc., for making glass and glassware.

CLASS 519.—Tools, implements, etc., for working metal, wood, and stone.

MACHINES AND IMPLEMENTS OF SPINNING, WEAVING, FELTING, AND PAPER MAKING.

CLASS 520.—Machines for the manufacture of silk goods.

CLASS 521.—Machines for the manufacture of cotton goods.

CLASS 522.—Machines for the manufacture of woollen goods, carpets, and tapestry.

CLASS 523.—Machines for the manufacture of linen goods.

CLASS 524.—Machines for the manufacture of rope and twine, and miscellaneous fibrous materials.

CLASS 525.—Machines for the manufacture of paper and felting.

CLASS 526.—Machines for the manufacture of india-rubber goods.

CLASS 527.—Machines for the manufacture of mixed fabrics.

CLASS 528.—Machines for the manufacture of wire cloth.

MACHINES, APPARATUS, AND IMPLEMENTS USED IN SEWING AND MAKING CLOTHING AND ORNAMENTAL OBJECTS.

CLASS 530.—Machines used in the manufacture of lace, floor-cloths, fancy embroidery, hair, ribbons, etc.

CLASS 531.—Sewing and knitting machines, clothes, corset, hat, and bonnet making machines.

CLASS 532.—Machines for preparing and working leather.

CLASS 533.—Machines for making boots and shoes.

CLASS 534.—Machines for ironing, drying, scouring, and cleaning.

CLASS 535.—Machines for making clocks and watches.

CLASS 536.—Machines for making jewelry.

CLASS 537.—Machines for making buttons, pins, needles, etc.

CLASS 538.—Pipes for smoking.

MACHINES AND APPARATUS FOR TYPESETTING, PRINTING, STAMPING, EMBOS- ING, AND FOR MAKING BOOKS, AND PAPER WORKING.

CLASS 540.—Printing, stamping, embossing, and lithographing presses.

CLASS 541.—Typecasting machines, apparatus of stereotyping.

CLASS 542.—Types and typesetting machines. Type-writing machines.

CLASS 543.—Printers' furniture.

CLASS 544.—Bookbinding machines.

CLASS 545.—Paper-folding machines.

CLASS 546.—Paper and card cutting machines, paper box machines.

CLASS 547.—Envelope machines.

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CLASS 552.—Steam, air, or gas engines, electro-magnetic engines.

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CLASS 554.—Screw propellers, wheels for the propulsion of vessels, and other motors.

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CLASS 567.—Diving apparatus and machinery.

CLASS 568.—Ice machines.

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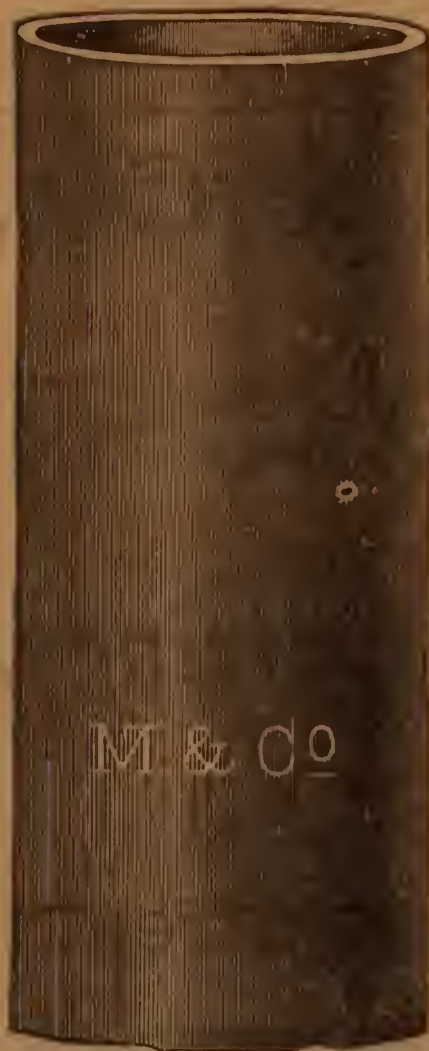
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 - b Paint mills, paint mixer. 508
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- 21 Albright & Stroh, Mauch Chunk, Pa.—Coal jig for separating slate from coal, etc. B 19. 505
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- 122 Ross, E. W., & Co., Fulton, N. Y.—Automatic circular saw mill. F 64, *and outside.* 511
- 123 Flint, C. M., Fitchburg, Mass.—Saw mill. B 13. (*Saw mill.*) 511
- 124 Noyes, Frank G., Clinton, Iowa.—Gang edger with four circular saws. B 12. (*Saw mill.*) 511
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- 132 Moore & Richie, Philadelphia, Pa.—Machine for casting medals, tags, cards, and emblems. (*Annex.*) 513

Metal-working Machines.

- 133 Reed, S. G., Boston, Mass.—Locomotive fire heater, carriage fire heater, portable gas attachment for lighting streets. E 69. 513
- 134 Malleable Iron Fittings Company, Brawford, Conn.—Steam and gas pipe, and castings. A 4. 513
- 135 Lawrence, Frank, Philadelphia, Pa.—Cupola and trier. (*In building of C. Noble & Co.*) 513
- 136 Keystone Portable Forge Co., Philadelphia, Pa.—Portable forges and blowers, pressure and exhaust blowers. (*Annex.*) 514
- 137 Carnell, F. L., & D. R., Philadelphia, Pa.—Steam hammers. (*Annex.*) 514
- 138 Forsaith, S. C., & Co., Manchester, N. H.—Abbe bolt forging machine, spring hammers. E 39, and *annex.* 514
- 139 Ferris & Miles, Philadelphia, Pa.—Steam hammers. B 30-32, and *annex.* 514
- 140 Merrill, Chas., & Sons, New York, N. Y.—Drop hammer, parallel vises, differential blocks. C 4, and *annex.* 514
- 141 Brownlee, A. B., & Co., Youngstown, Ohio.—Wrought-iron tuyere for furnace blast. (*Annex.*) 514
- 142 Metz, George W., & Sons, Philadelphia, Pa.—Bellows. (*Annex.*) 514
- 143 Bayliss, John, New York, N. Y.—Hot blast water tuyere and forge, blacksmiths' bellows, portable forge and bellows. (*Annex.*) 514
- 144 Bradley Manufacturing Co., Syracuse, N. Y.—Cushioned helve hammers. (*Annex.*) 514
- 145 Tubular Barrow & Truck Manufacturing Co., New York, N. Y.—Self-acting steam hammer. (*Annex.*) 514
- 146 Empire Portable Forge Co., Troy, N. Y.—Portable fan-blowing forges. (*Annex.*) 514
- 147 Bullock, T. H., & Co., Cleveland, Ohio.—Blacksmiths', moulders', hand, and coopers' bellows. (*Annex.*) 514
- 148 Hull & Belden Co., Danbury, Conn.—Power forging hammer, samples of drop forgings. C 72. 514
- 149 Howard, George C., Philadelphia, Pa.—Iron grindstone box, hacker, drill-press, perforator. B 31. 515
- 150 Rowe, George A., Philadelphia, Pa.—Lathe for engraving precious stones, glass, medals, etc. B 34. 515
- 151 Mitchell, J. E., Philadelphia, Pa.—Grindstones and fixtures, oilstones, hones. B 28. 515
- 152 Sternbergh, J. H., Reading, Pa.—Surface-grinding machine, bolts, nuts, washers, rivets, wood screws, etc. B 37. 515
- 153 American Twist Drill Co., Woonsocket, R. I.—Automatic knife-grinders, emery wheels and machinery. (*Annex.*) 515
- 154 Cooper, Jones, & Cadbury, Philadelphia, Pa.—Lathes. B 19. 515
- 155 Wattis, Edward, jr., Philadelphia, Pa.—Patent pocket flasks, with metallic collars secured without cement. B 34. 515
- 156 Stevens, W. X., East Brookfield, Mass.—Centre cutting shears for iron. B 34. 515
- 157 Ferris & Miles, Philadelphia, Pa.—Planing, shaping, slotting, drilling, cut-off, turning, boring, punching, and shearing machines. B 30-32, and *annex.* 515
- 158 Brown & Sharpe Manufacturing Co., Providence, R. I.—Machinery and tools. B 38. 515
- 159 Lobdell Car Wheel Co., Wilmington, Del.—Solid die rivet machine. E 65. 515
- 160 American Saw Co., Trenton, N. J.—B 33.
a Movable tooth circular, perforated, and solid saws. 510
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- 164 Lovegrove & Co., Philadelphia, Pa.—Pipe threading and cutting machine. B 75, and *boiler house.* 515
- 165 Thorne, De Haven, & Co., Philadelphia, Pa.—Drilling machines. B 30. 515
- 166 George & Du Laney, New York, N. Y.—Screw machinery. C 55, and B 29. 515
- 167 Merriman, A. H., West Meriden, Conn.—Power punching press. B 28. 515
- 168 Jones, Lanson, & Co., Windsor, Vt.—Engine lathes, screw machines, gang drills, etc. B 36. 515
- 169 Hodgman, A. D., New York, N. Y.—Sheet-metal and pasteboard-cutting machine. B 29. 515
- 170 Sellers, William, & Co., Philadelphia, Pa.—C 18, and *annex.*
a. Steam hammers. 514
b. Machine tools, punching, and shearing machines. 515
- 171 Washburn Machine Shop, Worcester, Mass.—Engine lathes with steel bearings. C 38. 515
- 172 Spiral Elliptic Spring Works, Cincinnati, Ohio.—Machinery for making upholstery springs. E 70. 515
- 173 Worcester, E. J., & Co., Worcester, Mass.—Vertical drills for metals, blacksmiths' lathe. C 32. 515
- 174 Schon, Mathias, Englishtown, N. J.—Tire upsetting machine. (*Annex.*) 515
- 175 Nichols, Pickering, & Co., Philadelphia, Pa.—Portable punches for punching spike holes in rails. E 71. 515
- 176 Prentice & Co., Worcester, Mass.—Lathes, slide rests, drills. C 31. 515
- 177 Van Hagen, C., & Co., Philadelphia, Pa.—Rotary shapers, iron planers, drill sharpeners, drills, and boring tools. C 30. 515

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- 178 Miller's Falls Co., Miller's Falls, Mass.—A 5.
a Scroll saw. 511
b Iron cutter, drilling machines. 515
c Vises. 519
- 179 Putnam Machine Co., Fitchburg, Mass.—Steam-engine, railroad, and machinists' tools. C 28. 515
- 180 Kreider, Campbell, & Co., Philadelphia, Pa. E 50.
a Engine lathe. 515
b Glassware grinding machine. 516
- 181 Springfield Elbow Co., Springfield, Ohio.—Sectional pipe elbows. B 35. 515
- 182 Coe, C. W., Fenton, Mich.—Hand-power drill press. B 29. 515
- 183 E. Horton & Son Co., Windsor Locks, Conn.—Lathe and car-wheel chucks. B 29. 515
- 184 Oneida Steam-Engine & Foundry Co., Oneida, N. Y.—Drill chucks. B 29. 515
- 185 Whiton, David E., West Stafford, Conn.—Gear-cutting machines, machines for centering iron, lathe chucks, drill chucks, etc. C 31. 515
- 186 Wicaco Screw and Machine Works, Philadelphia, Pa.—Special machine screws, studs, rolls, punches, dies, drills, taps, reamers, mills, etc. B 37. 515
- 187 Bliss & Williams, Brooklyn, N. Y.—Presses for making tinware and articles of sheet metals. C 30. 515
- 188 Chase, Pliny E., Newark, N. J.—Back-geared, screw-cutting, conical-bearing foot lathes, slide rests, and fittings. B 36. 515
- 189 Northampton Emery-Wheel Co., Leeds, Mass.—Solid emery wheels, and machinery for showing uses. (*Annex.*) 515
- 190 Prouty, A. B., Worcester, Mass.—Chucks and jaws for iron planers. C 32. 515
- 191 Racine Hardware Manufacturing Co., Racine, Wis.—Jewelers' and dentists' polishing and turning lathes, power wheels, engraving blocks, and other tools. C 41. 515
- 192 Newbold, Richard S., & Son, Norristown, Pa.—Rotary shear for sheet and plate iron. B 33. 515
- 193 Watson, James, Philadelphia, Pa.—Non-changeable gap lathe. C 31. 515
- 194 Mitchell, J. H., Philadelphia, Pa.—Grindstone boxes. B 80. 515
- 195 Wharton, Wm., jr., Philadelphia, Pa.—Rail-bending machine. D 72. 515
- 196 Seymour, Frederick J., Wolcottville, Conn.—Machinery for spinning articles of hollow-ware from sheet metal. C 26. 515
- 197 Kennedy, DeLancy, New York, N. Y.—Shearing, punching, griping, and pressing tools and machinery; spiral punch and die. B 37. 515
- 198 Cummings, Geo. L., New York, N. Y.—Grindstone frames. B 34. 515
- 199 Flather & Co., Nashua, N. H.—Engine lathes, tapping machine. B 34. 515
- 200 Dariot, Constant, Philadelphia, Pa.—Foot lathe, with slide rest, etc. C 34. 515
- 201 Celluloid Emery Wheel Co., Newark, N. J.—Celluloid emery and corundum wheels. (*Annex.*) 515
- 202 Teal, C. A., & W. L., Philadelphia, Pa.—Boiler rolls, punching and shearing machines, hair-picking machine. C 25. 515
- 203 Scofield, Charles, Vineland, N. J.—Machine for straightening shafting in position. C 34. 515
- 204 Cox & Sons, Bridgeton, N. J.—Steam and gas-fitters' tools, supplies, etc. C 32. 515
- 205 Hamlin, G. A., Philadelphia, Pa.—Machinery for refitting valves. C 34. 515
- 206 Lehigh Valley Emery Wheel Co., Weissport, Pa.—Emery wheels and fixtures. (*Annex.*) 515
- 207 Fitchburg Machine Co., Fitchburg, Mass.—Lathes and Drills. C 38. 515
- 208 Ames Manufacturing Co., Chicopee, Mass.—Engine lathes, planer, drills, edging machine, die-sinking machine. C 38 to 40. 515
- 209 Gray, J. Hammond, Philadelphia, Pa.—Screw machinery, for turning and threading screws, etc. B 27. 515
- 210 Hilles & Jones, Wilmington, Del.—Radial drills and slotting machine. B 37. 515
- 211 Hardy Machine Co., Biddeford, Maine.—Emery wheel card-grinders, cloth-shear, and planer knife grinders. B 35. 515
- 212 Stacy Stone Dressing Machine Co., New York, N. Y.—Stone-dressing machine. (*Annex.*) 516
- 213 Rogers, William A., Cambridge, Mass.—Automatic machine for grinding surfaces on glass, etc. C 42. 516
- 214 Branch, Crookes, & Co., St. Louis, Mo.—Diamond saws and mills for cutting stone. (*Saw mill.*) 516
- 215 Steam Stone Cutter Co., Rutland, Vt.—Stone channeling or quarrying machines, block of machine-cut marble. (*Annex.*) 516
- 216 Emerson Stone Saw Co., Pittsburgh, Pa.—Diamond circular stone saw. (*Annex.*) 516
- 217 Batley, John, & Co., Philadelphia, Pa.—Shaping machine, for moulding, paneling, or carving on marble, etc. (*Annex.*) 516
- 218 Castle, Wm. W., Belfast, Maine.—Stone-polishing machines, steel quarry square, machine for centering stone columns, bush hammers. (*Annex.*) 516
- 219 Ryan, Jas. M., Cincinnati, Ohio.—Silver-plated lathe, show cases, and cut glass. D 38. 516
- 220 Ross, Thos., Rutland, Vt.—Stone-sawing machine. (*Annex.*) 516
- 221 Young, Hugh, New York, N. Y.—Reciprocating stone-sawing machines. (*Saw mill.*) 516
- 222 Union Stone Co., Boston, Mass.—Emery wheels and machinery for grinding and polishing iron and steel. B 4, and *annex.* 515

Brick and Glass Machines, Machinists' Tools.

- 223 Carnell, F. L., & D. R., Philadelphia, Pa.—Fire and pressed brick machines, model of brick machine. (*Annex.*) 517
- 224 Newkumet, Adam, Philadelphia, Pa.—Crucible and pottery ware machines, drying apparatus for glass-house pots, retorts, etc. 517
- 225 Miller, Samuel P., & Son, Philadelphia, Pa.—Hand brick press, model of clay-tempering machine, brickmakers' tools. (*Annex.*) 517
- 226 Carnell, Geo., Philadelphia, Pa.—Brick press and pug mill. (*Annex.*) 517
- 227 Morand, Augustus, Philadelphia, Pa.—Brick-making machine. (*Annex.*) 517
- 228 Garretson, I. H., Keokuk, Iowa.—Brick-moulding machine, ring fence. (*Annex.*) 517
- 229 Excelsior Brick & Stone Co., Philadelphia, Pa.—Model of brick machine, samples of brick and stone. (*Annex.*) 517
- 230 McLean & Bennor Brick Machine Co., Philadelphia, Pa.—Impact brick machine, making brick with a blow. (*Annex.*) 517
- 231 Chambers, Bro., & Co., Philadelphia, Pa.—Archimedian brick machine. D 23. 517
- 232 Hotchkiss, James, Springfield, Ohio.—Brick machine. (*Outside of building.*) 517
- 233 Gregg, Isaac, jr., & Co., Philadelphia, Pa.—Steam brick machine, one-faced front brick. (*Annex.*) 517
- 234 Hazlehurst, Samuel, St. Louis, Mo.—Hand brick-moulds. (*Annex.*) 517
- 235 Turner, Parks, & Co., Cuyahoga Falls, N. Y.—Balance valve, clay mill. E 58, and outside, near annex. 517
- 236 Gregg, Wm. L., Philadelphia, Pa.—Triple pressure brick machines, ceramic gas-kiln. (*Annex.*) 517
- 237 Great American Brick Machine Co., Croton, N. Y.—Brick machine and trucks. (*Annex.*) 517
- 238 Sharts, Theodore, New York, N. Y.—Brick-kiln arch irons. D 10-80, and annex. 517
- 239 Williams, S., & Son, Philadelphia, Pa.—Brick makers' implements. (*Annex.*) 517
- 240 Stockwell, J. W., Portland, Me.—Cement pipe machinery, concrete mixing, sewer pipe tamper, moulds for drain pipe, samples of work. (*Annex.*) 517
- 241 Martin, Henry, Lancaster, Pa.—Self-acting brick machine. (*Annex.*) 517
- 242 Lafler, J. A., Albion, New York.—Brick-making machine in operation, brick mould, bricks, and model of brick machine. (*Annex.*) 517
- 243 Hamilton, S. M., Baltimore, Md.—Perpetual brick kiln. (*Annex.*) 517
- 244 Mathieu, Charles, Colosse, N. Y.—Glass-blowing steam-engine. E 74. 518
- 245 Burgess, Warren S., Norristown, Pa.—Blow pipe, animal-clipping machine. E 74. 518
- 246 Holzer, William, Philadelphia, Pa.—Process of manufacture of druggists', chemists', perfumers', philosophical and fancy glassware. B 32. 518
- 247 Brooke, Homer, New York, N. Y.—Glass manufacturers' moulds and presses. E 75. 518
- 248 Chase, B. F., E. Stroudsburg, Pa.—Glass-blowing machines. E 74. 518
- 249 Steele Brothers, Philadelphia, Pa.—Glass engraver at work. E 75. 518
- 250 McCaffrey & Bro., Philadelphia, Pa.—Hand-cut files and rasps. A 41. 519
- 251 Krumbhaar, Alexander, Philadelphia, Pa.—Hand-cut files and rasps. A 43. 519
- 252 Barnett, G., & H., Philadelphia, Pa.—Files and rasps. A 41. 519
- 253 Flagg, Stanley G., & Co., Philadelphia, Pa.—Carriage hardware. A 41. 519
- 254 Hoopes & Townsend, Philadelphia, Pa.—Bolts, cold-punched nuts, washers, chain links, wood screws, rivets. C 32. 519
- 255 Stephens Patent Vise Co., New York, N. Y.—Parallel vises, with attachments, planer vise, with taper attachments. B 6. 519
- 256 Billings & Spencer Co., Hartford, Conn.—Drop forgings, machinists' small tools. B 5. 519
- 257 Brainard Milling Machine Co., Boston, Mass.—C 38-40.
a Milling machines, screw machine, mill grinding machines. 515
b Steel bar vises. 519
- 258 Bedell, Otis T., New York, N. Y.—Screw wrench. B 40. 519
- 259 Monk, Chas., Brooklyn, N. Y.—Iron moulders' steel-finishing tools. B 40. 519
- 260 Silver and Deming Manufacturing Co., Salem, Ohio.—Blacksmiths' post and table drills. F 54. 519
- 261 Morse Twist Drill and Machine Co., New Bedford, Mass.—Drills, reamers, chucks, mills, gauges, taps, dies, screw plates, tap wrenches. B 40. 519
- 262 Plumb, Burdick, & Barnard, Buffalo, N. Y.—Bolt-forging machines, with forge. (*Annex.*) 519
- 263 Clark Brothers & Co., Hillsdale, Conn.—Bolts, rivets, nuts, washers, etc. B 6. 519
- 264 Parker, Chas., Meriden, Conn.—Vises. B 6. 519
- 265 Fisher & Norris, Trenton, N. J.—Double screw parallel vises, cast steel faced anvils. B 6, and annex. 519
- 266 Western File Co. (Limited), Beaver Falls, Pa.—Machine-cut files. A 41. 519
- 267 Haase, John A., Philadelphia, Pa.—Floor and door clamps, ratchet drills. B 41. 519
- 268 Simonds Manufacturing Co., Fitchburg, Mass.—Knives and sickles for mowers and reapers, planing machine knives, circular saws. B 7 and 8, from pump annex west. 519
- 269 Rutschmann Bros., Philadelphia, Pa.—Self-feeding hand drill. B 29. 519

Machinists' Tools, Silk, Woolen, Cotton Machines.

- 270 Beck, J. D., Liberty, Pa.—Non-de-
facing vises. B 40. 519
- 271 Russell, Burdsall, & Ward, Port
Chester, N. Y.—Bolts for manufacturers'
use. A 40. 519
- 272 Clark Bros., Philadelphia, Pa.—Ec-
centric or cam rivet pipe tongs. B
40. 519
- 273 Pool, A. Alex., & Co., Newark, N. J.
—Steel arbors for machinists and jewelers.
D 40. 519
- 274 Wood, Geo. W., Philadelphia, Pa.
—Self-adjusting flooring clamp and lifting
jack. A 41. 519
- 275 Orum, Morris L., Philadelphia, Pa.
—Flexible mandrels for bending metal
pipe. B 40. 519
- 276 Eaton, Cole, & Burnham Co., New
York, N. Y.—Brass and iron goods for
plumbers, tools, vises; cast iron radi-
ators. B 6. 519
- 277 Shaw, Thomas, Philadelphia, Pa.
—Lathe tools. D 69. 519
- 278 Nicholson File Co., Providence, R.
I.—Files finished, ground, and forged;
file steel. A 42. 519
- 279 American File Co., Pawtucket, R.
I.—Files, file-testing machine. B 39. 519
- 280 Hey, Henry T., Philadelphia, Pa.
—Measuring gauge. A 41. 519
- 281 Spiral Tubing Co., Boston, Mass.
—Machine for making spiral seam pipe.
B 34. 519
- 282 Hewitt & Follensbee, Washing-
ton, D. C.—Machines for filing and set-
ting saws. A 29. 515
- 283 Wilkinson, A. J., & Co., Boston,
Mass.—Foot-power lathe, bench lathes,
small-power planer, hand-planer. C 38-
42. 519
- 284 Wyman, J. Dana, Boston, Mass.—
Self-heating soldering iron. B 49. 519
- 285 Backus, Q. S., Winchendon, Mass.
—Bit braces, ratchet braces, tack ham-
mers, etc. A 40. 519
- 286 Johnson, Wm., Lambertville, N. J.
—Universal lathe chuck. C 77. 519
- Machines and Implements of Spin-
ning, Weaving, Felting, and Pa-
per Making.**
- 287 Cutter, John D., & Co., New York,
N. Y.—Jacquard silk loom in operation;
mechanism for measuring silk while spool-
ing it. B 30. 520
- 288 Knowles & Bro., Worcester, Mass.
—D 51.
a Looms for silk dress goods, ribbons,
webbings, etc. 520
b Looms for plain and fancy woolen
goods. 522
- 289 Bacon, Leonard H., Hartford,
Conn.—Needle loom for weaving silk dress
goods. D 31. 520
- 290 Wrigley, John, Paterson, N. J.—
Jacquard loom, changeable for power or
hand. D 28. 520
- 291 Danforth Locomotive and Machine
Co., Paterson, N. J.—Silk machinery.
D 23 and 41. 520
- 292 Nonotuck Silk Co., Florence, Mass.
—Machinery for throwing and finishing
organzine, sewing silk, twist, and embroi-
dery; machine for printing spools. D
41. 520
- 293 Holland Manufacturing Co., Willi-
mantic, Conn.—Machines for winding,
measuring, and testing the strength of
sewing silk and other threads. D 34. 520
- 294 Mitchell, J. M., Philadelphia, Pa.—
Cotton and woolen manufacturers' sup-
plies, belting, hose, reeds, machinery, etc.
C 51. 521
- 295 Avery, John G., Worcester, Mass.
—Thread, twine, and cord machinery. D
54. 521
- 296 New York Mills, Oneida Co., N. Y.
—Machinery, weaving cotton sheetings.
C 46. 521
- 297 Planet Mills Manufacturing Co.,
Brooklyn, N. Y.—Canvas-weaving power
loom. C 46. 521
- 298 Butterworth, H. W., & Sons, Phil-
adelphia, Pa.—Drying machines for mus-
lins, prints, tickings, etc.; dyeing ma-
chines for cotton warps. D 44 to 48. 521
- 299 Willimantic Linen Co., Hartford,
Conn.—Spool cotton thread-winding and
ticketing machines. C 51. 521
- 300 Clark Thread Co., Newark, N. J.—
Self-acting spool-winding machine; show
case. C 33 and A 34. 521
- 301 Dutcher Temple Co., Hopedale,
Mass.—Power loom temples. C 37. 521
- 302 Kitson Machine Co., Lowell, Mass.
—C 34.
a Cotton openers and sappers. 521
b Shoddy pickers and rag dusters. 522
c Needle-pointed wood and leather card
clothing. 527
- 303 Prouty, A. B., Worcester, Mass.—
Card-setting machine. C 32. 521
- 304 Carroll, William, Worcester, Mass.
—Ring-spinning machine. C 50. 521
- 305 Gibbs Loom Harness and Reed
Co., Clinton, Mass.—Loom harness and
reeds used for weaving. C 50. 521
- 306 Rockville Traverse Card Grinding
Co., Rockville, Conn.—Traverse grinder
for woolen and cotton cards and shears.
C 50. 521
- 307 Poole, J. Morton, & Co., Wilming-
ton, Del.—C 60.
a Glazing cylinder for finishing cotton
goods. 521
b Chilled roll callenders, for paper-makers'
use, ground chilled roll. 525
- 308 Hope & Co., Providence, R. I.—
Pantograph engraving machine for calico
printers' plates. C 41. 521
- 309 Ingersoll & Balston, Greenpoint,
N. Y.—Hand-power hay and cotton press.
C 55. 521
- 310 Butler, Brown, & Co., Providence,
R. I.—Ring travelers and belt hooks.
C 34. 521
- 311 Ross, L. E., Providence, R. I.—
Spring shuttle motion for looms, indepen-
dent of speed; loom with motion at-
tached. C 36. 521
- 312 Palmer European Patent Tentering
and Finishing Machine Co., Norwich,
Conn.—Machinery for stretching, tenter-
ing, and drying woven fabrics, laces, etc.
C 56. 521

Woolen, Cotton, Paper, Sewing Machines.

- 313 Providence Machine Co., Providence, R. I.**—Spinning machinery, card and spinning frame built by Samuel Slater in 1796. D 36. 521
- 314 Hill, James, Providence, R. I.**—Tin filling box, tin cotton can. D 35. 521
- 315 Wood, Thomas, Philadelphia, Pa.**—Four-power looms, bobbin-winder, pulleys and hangers for cotton machinery. C 54. 521
- 316 Eaton & Ayer, Nashua, N. H.**—Bobbins, spools, shuttles, skeivers, etc., for spinning and weaving textiles. C 68. 521
- 317 Leonard & Silliman, Bridgeport, Conn.**—Mill spindle with driver, step, and points. E 56. 521
- 318 Shaw, George W., St. Louis, Mo.**—Continuous wool spinner. D 53. 521
- 319 Foss & Pevey, Lowell, Mass.**—Under flat cotton card. C 38. 521
- 320 Cleveland Machine Works, Worcester, Mass.**—Double-acting gig. D 47. 521
- 321 Howard, George C., Philadelphia, Pa.**—Winding and measuring machine, testing and shearing machine. B 31. 522
- 322 Avery, John G., Worcester, Mass.**—Continuous wool spinner. D 53. 522
- 323 Lyall, J., & W., New York, N. Y.**—Positive motion looms, weaving various fabrics. C 46 and 49. 522
- 324 Smith, James, & Co., Philadelphia, Pa.**—Machinery for manufacturing fabrics; manufacturers' supplies. D 62. 522
- 325 Furbush, M. A., & Son, Philadelphia, Pa.**—Carding machines, self-acting spinning mule. D 52. 522
- 326 New England Co., Rockville, Conn.**—Spooler, warp dresser, reel, beamer. D 46. 522
- 327 Thames River Worsted Co., Norwich, Conn.**—Spinning frame with ring and transverse bar. D 48. 522
- 328 Parks & Woolson Machine Co., Springfield, Vt.**—Cloth-shearing machine, cloth-brushing machine, etc. D 41. 522
- 329 Furbush, M. A., & Son, Philadelphia, Pa.**—Ingrain carpet power loom. D 52. 522
- 330 Short, James, New Brunswick, N. J.**—Positive motion loom for carpeting. D 47. 522
- 331 Crabb, William, Newark, N. J.**—Hackles, wood and leather card clothing, wool combs, picker teeth, comb pins. C 63. 522
- 332 Butterworth, James, & Son, Philadelphia, Pa.**—Rag, waste, and shoddy picker. D 58. 522
- 333 Dornan Bros. & Co., Philadelphia, Pa.**—Shading carpet power loom without shuttles. D 46. 522
- 334 Silcott, Millikan, & Gold, Washington C. H., Ohio.**—Cloth-measuring and rolling machine. D 52. 522
- 335 McCausland, John, Providence, R. I.**—Paper cop for woolen spinning. D 49. 522
- 336 Hillman, Lewis, Philadelphia, Pa.**—Automatic measuring machine. D 43. 522
- 337 Draper, George, & Son, Hopedale, Mass.**—Spinning frame, spooler, warper, and creel; twister, spinning rings. C 51. 522
- 338 Whitney, Baxter D., Winchendon, Mass.**—Wool-spinning machine. D 53. 522
- 339 Turner, Isaac, & Co., Boston, Mass.**—Rotary knife cloth-cutting machine. C 73. 522
- 340 Rice, Barton, and Fales Machine and Iron Co., Worcester, Mass.**—Drying and tentering machine, hydro-extractor. D 42. 522
- 341 Crabb, William, Newark, N. J.**—Rope-makers' pins, gills. C 63. 524
- 342 Kuh, Sol., Grand Junction, Iowa.**—Straw-twister, matting-weaver, etc. C 63. 524
- 343 Gavit Machine Works, Philadelphia, Pa.**—Paper-making machine and adjuncts. F 65-73. 525
- 344 Lobdell Car Wheel Co., Wilmington, Del.**—Chilled-iron callender rolls for paper. E 65. 525
- 345 Holyoke Machine Co., Holyoke, Mass.**—Web callender; beating-rag engine. F 74. 525
- 346 Entekin, William G., Philadelphia, Pa.**—Enameler for burnishing photographs, paper, etc. C 41. 525
- 347 Ross, E. W., & Co., Fulton, N. Y.**—Paper mill. F 64, and outside. 525
- Machines, Apparatus, and Implements used in Sewing and making Clothing and Ornamental Objects.**
- 348 Butler Braider Co., Clinton, Mass.**—Braiding machinery. C 42. 530
- 349 Wimpfheimer, Mrs. C., Philadelphia, Pa.**—Loom for manufacture of hair-ribbon. C 42. 530
- 350 Marin, Charles, New York, N. Y.**—Embroidery machine. C 43. 530
- 351 Oppenheimer, J. D., Philadelphia, Pa.**—Process for curling hair by steam or hot water. C 43. 530
- 352 Howard, George C., Philadelphia, Pa.**—Forming-presses for buckram, felt, leather, etc. D 31. 531
- 353 American Buttonhole, Overseaming, and Sewing Machine Co., Philadelphia, Pa.**—Sewing machines. C 61. 531
- 354 Franz & Pope Knitting Machine Co., Bucyrus, Ohio.**—Automatic knitting machines, seamless hosiery knitting machines; samples of work. C 64. 531
- 355 Wheeler & Wilson Manufacturing Co., Bridgeport, Conn.**—Sewing machines and attachments; samples of work. C 44. 531
- 356 Washburn Machine Shop, Worcester, Mass.**—American drawing models, adjustable drawing tables. C 38. 531
- 357 Wensley, James, Philadelphia, Pa.**—Improvement in buttonhole sewing machines. C 46. 531
- 358 Lamb Knitting Machine Manufacturing Co., Chicopee Falls, Mass.**—C 64.
a Knitting machines. 531
b Egg beaters. 224

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- 359 Howe Machine Co., Bridgeport, Conn.—Sewing machines. C 52. 531
- 360 Rex & Bockius, Philadelphia, Pa.—Sewing machine. C 69. 531
- 361 Bartlett, Joseph W., New York, N. Y.—Reversible sewing machines. C 45. 531
- 362 Wilson Sewing Machine Co., Chicago, Ill.—Sewing machines. C 47. 531
- 363 Billings & Spencer Co., Hartford, Conn.—Sewing machine shuttles. B 5. 531
- 364 Wilcox & Gibbs Sewing Machine Co., New York, N. Y.—Sewing machines with automatic tension, etc. C 50. 531
- 365 Warth, Albin, Stapleton, N. Y.—Cutting machines for clothing, notching implement for patterns, folding machine. C 70. 531
- 366 United States Corset Co., New York, N. Y.—Corset-weaving powerloom. C 46. 531
- 367 DuLaney, G. L., & Co., New York, N. Y.—Sewing machine. C 53; B 29. 531
- 368 Florence Sewing Machine Co., Florence, Mass.—Sewing machines. C 51. 531
- 369 Davis Sewing Machine Co., Watertown, N. Y.—Sewing machines. C 51. 531
- 370 National Suspender Co., New York, N. Y.—Loom for manufacturing suspenders. C 69. 531
- 371 St. John Sewing Machine Co., Springfield, Ohio.—Sewing machines. C 54. 531
- 372 Beckwith Sewing Machine Co., New York, N. Y.—Sewing machines. C 55. 531
- 373 McLean & Bennor Machine Co., Philadelphia, Pa.—Sewing machines. C 63. 531
- 374 Johnson, Clark, & Co., Boston, Mass.—Sewing machines. C 59. 531
- 375 Campbell & Clute, Cohoes, N. Y.—Double table knitting machine, yarn winder, turning-off machine. C 64. 531
- 376 Hart, Wm. H., jr., Philadelphia, Pa.—Holding, delivering, and feeding machine. C 65. 531
- 377 Yule, George, Newark, N. J.—Wool forming machine, sizing, stiffening, body stretching, etc., for hatters' use. C 67. 531
- 378 Victor Sewing Machine Co., Middletown, Conn.—Sewing machines, adjustable drill chuck, compensating journal. C 58. 531
- 379 Wagener, Jeptha, Holtsville, N. Y.—Sewing machines, carriages, and attachments. C 62. 531
- 380 Whitney Manufacturing Co., Paterson, N. J.—Sewing machines. C 58. 531
- 381 Singer Manufacturing Co., Elizabethport, N. J.—Sewing machines, samples of work, and case of machine twist. (*Special building.*) 531
- 382 Home Knitter Co., Alliance, Ohio.—One-needle knitter for stockings. C 64. 531
- 383 Universal Thread Co., Newark, N. J.—Fulling machine for hat manufacturing, etc. C 50. 531
- 384 New York Needle Co., Jersey City, N. J.—Needles, shuttles, and sewing machine attachments. C 66. 531
- 385 Shutt, Daniel, New York, N. Y.—Machine-needle threaders. F 33. 531
- 386 Lathrop Anti-frictionate Co., New York, N. Y.—Anti-frictionate sewing machine. D 68. 531
- 387 Dyson Needle Co., New Britain, Conn.—Spring-needles and points for knitting machines. C 63. 531
- 388 Humphrey Bros., Boston, Mass.—Single-thread button-hole machine, with automatic feed. C 52. 531
- 389 Thomas, W. S., Laconia, N. H.—Knitting machines. C 61. 531
- 390 Hinkley, Jonas, Norwalk, Ohio.—Carpet and floor sweeper, knitting machines. C 62. 531
- 391 Rardon, James S., Cincinnati, Ohio.—Buttonholer, for sewing machines. C 56. 531
- 392 Pearson, William, Philadelphia, Pa.—Hosiery-seaming machine. C 62. 531
- 393 Taft, J. C., Providence, R. I.—Sewing machines. C 7. 531
- 394 Hull & Belden Co., Danbury, Conn.—Machine for forming fur hats. C 72, and annex. 531
- 395 Domestic Sewing Machine Co., New York, N. Y.—Sewing machines. C 57. 531
- 396 Bickford, Dana, New York, N. Y.—Automatic knitting machines. C 73. 531
- 397 Shaw, Mrs. Elizabeth F., Brooklyn, N. Y.—Dress-protector for sewing machines. C 59. 531
- 398 Armour Knitting Machine Co., Watertown, N. Y.—Family knitting machine. C 53. 531
- 399 Wardwell Manufacturing Co., St. Louis, Mo.—Family sewing machine. C 63. 531
- 400 National Hat-Pouncing Machine Co., New York, N. Y.—Machinery to shear the surface of fur and wool hats. C 70. 531
- 401 Eickmeyer Hat-Blocking Machine Co., New York, N. Y.—Machinery to stretch, block, iron, and sew sweats into fur and wool hats. C 70. 531
- 402 Cuming, M. A., New York, N. Y.—Hand-power hydraulic hat press. C 62. 531
- 403 Fish, Warren L., Newark, N. J.—Sewing machines. C 46. 531
- 404 Mosser, Wm. F., & Co., Allentown, Pa.—Bark mill, with independent grinding segments. A 48, and pump annex. 532
- 405 Oakley & Keating, New York, N. Y.—Washing machine. E 80. 534
- 406 Buck, Isaiah D., Conshohocken, Pa.—Suction washing machine. E 76. 534
- 407 Woods, George, & Co., Cambridgeport, Mass.—Drying process. E 78. 534
- 408 Lewis, Rufus S., New Hampton, N. H.—Ironer and polisher for laundry use. E 77. 534
- 409 Sternberger, Leopold, Philadelphia, Pa.—Steam starching, ironing, and polishing machines for laundries. (*Pump annex.*) 534

Clothing, Jewelers', and Printers' Machines.

- 410 Calkins Champion Washer Co., Chicago, Ill.—Washing machine. E 76. 534
- 411 York Manufacturing Co., York, Pa.—Washing machine. D 78. 534
- 412 Bing, James, Philadelphia, Pa.—Mangle. E 77. 534
- 413 Walker, W. B., Boston, Mass.—Machine for pressing garments; smoothing-iron and sad-irons. E 79. 534
- 414 Briggs, Nicholas A., Shaker Village, N. H.—Shaker washing machine. E 79. 534
- 415 Burt & Putnam, Rockville, Conn.—Washer for scouring cloth. E 78. 534
- 416 Felder, Charles, New York, N. Y.—Plaiting, pinking, fluting, and crimping machines. C 62. 534
- 417 Storrs, Levi B., Canton, N. Y.—Pressing machines for tailors' use. E 79. 534
- 418 American Watch Co., Waltham, Mass.—Machinery used in watch-making. C 41. 535
- 419 Chormann, E. G., Philadelphia, Pa.—Engraving machine, with slide rest and attachments. D 38. 535
- 420 Stilwell & Pierce, Newark, N. J.—Jewelers' lathes, foot-press for rolling-mill, gold ingot. D 80. 536
- 421 National Needle Co., Springfield, Mass.—Machine for making hand and sewing-machine needles. C 40. 537
- 422 Pyramid Pin Co., New Haven, Conn.—Machine for sticking pins in paper. C 42. 537
- 423 Huston, R. W., Brooklyn, N. Y.—Spiral safety pins, and automatic machines for manufacturing the same. C 43. 537
- Machines and Apparatus for Type Setting, Printing, Stamping, Embossing, and for Making Books, and Paper Working.**
- 424 Howard, George C., Philadelphia, Pa.—Plate press, screw, printing and embossing press. B 31. 540
- 425 Kelsey, W. A., & Co., Meriden, Conn.—Portable printing presses. F 32. 540
- 426 Hickok, W. O., Harrisburg, Pa.—Paper-ruling machines, head-striking machine, book-binders' standing press, and board cutter. F 34. 540
- 427 Gordon, George P., New York, N. Y.—Printing presses. F 34-36. 540
- 428 Potter, C., jr., & Co., New York, N. Y.—Book, job, and newspaper printing presses. F 25. 540
- 429 Rex & Bockius, Philadelphia, Pa.—Printing presses. C 69. 540
- 430 Renick, B. F., & Co., Canton, Ohio.—Printing press. F 30. 540
- 431 Lent, A. E., Philadelphia, Pa.—Press for printing steel and copper plates. E 28. 540
- 432 Degener & Weiler, New York, N. Y.—Printing machines. F 20. 540
- 433 Golding & Co., Boston, Mass.—Printing presses, printers' tools. E 30. 540
- 434 Rosenthal, Isador, New York, N. Y.—Apparatus for stamping patterns of ladies' garments. E 32. 540
- 435 Hammett, L. C., Philadelphia, Pa.—Printers' rollers and composition. E 40. 540
- 436 Linfoot, Benjamin, Philadelphia, Pa.—Litho and zincographic printing machine, crank bed, self-adjusting scraper, and tympan pressure, bed feed. E 29. 540
- 437 Bagger, Louis, Washington, D. C.—Printing press using compound lithographic stones. E 31. 540
- 438 Haughwout, E. V., New York, N. Y.—Two printing presses. E 31. 540
- 439 Bullock Printing Press Co., Philadelphia, Pa.—Printing presses and stereotyping machinery. E 25. 540
- 440 Cottrell & Babcock, New York, N. Y.—Stop-cylinder press, roller-drum cylinder press, perfecting press for illustrated cut work. F 26. 540
- 441 Child, C. C., Boston, Mass.—Printing presses. F 32. 540
- 442 Daughaday, J. W., & Co., Philadelphia, Pa.—Printing press, self-feeding attachment. E 31. 540
- 443 Woods, B. O., & Co., Boston, Mass.—Amateur printing presses, improved type cases. E 30. 540
- 444 Dickson, John, & Co., Philadelphia, Pa.—Engraving on vulcanized rubber for printing on letter-press. E 32. 540
- 445 Ferre, Samuel P., Philadelphia, Pa.—Chromotype cylinder printing press, prints five colors at once. E 32. 540
- 446 Cook, William, Daretown, N. J.—Automatic paper feeder for printing presses and ruling machines. E 31. 540
- 447 Shutt, Daniel, New York, N. Y.—Printing press. F 33. 540
- 448 Shutt, D., New York, N. Y.—Machine for making needle-threaders for sewing machines. F 33. 540
- 449 Safford, Geo. W., & Co., Boston, Mass.—Printing presses. F 19. 540
- 450 Shiland, Alex., West Troy, N. Y.—Typographic and stereotyping machine and copying press. E 30. 540
- 451 Parks, John A., New York, N. Y.—Hand and scraper pattern power lithographic printing presses. F 28. 540
- 452 Boston and Fairhaven Iron Works, Fairhaven, Mass.—Newspaper and job printing press. F 29. 540
- 453 Bencke & Scott, New York, N. Y.—Process of manufacturing chromo picture entitled, "One Hundred Years Ago." F 19. 540
- 454 Howell & Brothers, Philadelphia, Pa.—Wall paper printing machine, cutting off and rolling machine, hanging up and hardening machines. F 55-80. 540
- 455 Gorham, W. B., & Co., Boston, Mass.—Rotary, lever, and treadle presses. E 26. 540
- 456 Mann, Wm. H., Philadelphia, Pa.—Steam paging and numbering machine. E 32. 540
- 457 Newbury, A., & B., Coxsackie, N. Y.—Printing press. F 33. 540

Printing and Paper-working Machines, Engines.

- 458 Globe Manufacturing Co., Palmyra, N. Y.—E 28.
a Printing presses. 540
b Paper cutters. 546
- 459 Mackellar, Smiths, & Jordan, Philadelphia, Pa.—Type founding machinery for casting and finishing types, types and printing materials. E 5. 541
- 460 Grant, Geo. B., Boston, Mass.—Calculating machines. E 44. 542
- 461 Daul, A., Newark, N. J.—Writing and matrix machines. E 5. 542
- 462 Bain, John W., Philadelphia, Pa.—Type writer. E 5. 542
- 463 Pratt, John, Centre, Ala.—Type writing machine. E 40. 542
- 464 Standard Laundry Machinery Co., Boston, Mass.—E 77.
a Washing, wringing, and starching machines. 544
b Telegraph copying machine. 542
- 465 Page, Wm. H., & Co., Greeneville, Conn.—Wood type, specimen books of wood type. E 5. 542
- 466 Bruce's Son, Geo., & Co., New York, N. Y.—Book of printing types, and cases of samples of printing types. E 5. 542
- 467 Hoffman & Hoyt, New York, N. Y.—Copying presses. E 5. 542
- 468 Corey & Harper, Philadelphia, Pa.—Justifying type-setting machine. E 45. 542
- 469 Brainard, Charles R., Boston, Mass.—“Bank” and copy distributor for printing office. E 40. 542
- 470 Boomer & Boschert Press Co., Syracuse, N. Y.—Copying press, paper presses, glue press, leather-binding press, cloth-baling press. E 39. 544
- 471 Shive Governor Co., Bethlehem, Pa.—Portable bookbinder. D 6j. 544
- 472 Automatic Book-Sewing Machine Co., Milford, Conn.—Book-sewing, pamphlet wire-stitching, and magnetic lasting machines. F 33. 544
- 473 Standard Machinery Co., Mystic River, Conn.—Steam rounding and backing machine, automatic book trimmer, and power paper cutter. E 40. 544
- 474 Semple, Mary H., Lowell, Mass.—Steam cutter for bookbinders' use. F 33. 544
- 475 Wm. F. Murphy's Sons, Philadelphia, Pa.—F 34-6.
a Blank-book manufactory and printing office. 544
b Paper-cutting machine. 546
- 476 Francis & Loutrel, New York, N. Y.—Folding machine for blank-book makers and paper mills. F 34-36. 545
- 477 Forsaith, S. C., & Co., Manchester, N. H.—Newspaper folding machine. E 39, and annex. 545
- 478 Chambers, Bro., & Co., Philadelphia, Pa.—Newspaper folder, paster, and trimmer; book-folder; periodical folder, paster, and coverer. D 23. 545
- 479 Molyneaux, J. B., Cleveland, Ohio.—Newspaper folding machine. E 32. 545
- 480 Jaeger, Gustav L., New York, N. Y.—Paper-lining machine. D 24. 546
- 481 Brown & Carver, Philadelphia, Pa.—Card and paper cutters. E 26. 546
- 482 Beck, Charles, Philadelphia, Pa.—Machinery for making paper boxes and cutting paper. D 25. 546
- 483 Child, C. C., Boston, Mass.—Paper cutter. F 32. 546
- 484 Cleveland Paper Box Machine Co., Cleveland, Ohio.—Machine for making paper boxes, cutting press, nicking machine for blanks. D 25. 546
- 485 Riehl, M., & Sons, Philadelphia, Pa.—Self-clamping book-cutting machine and paper-cutting machine. D 25. 546
- 486 Kerr, Norman M., & Co., Philadelphia, Pa.—Manufacture of paper boxes. D 25. 546
- 487 Novelty Paper Box Co., Philadelphia, Pa.—Book stitching and sewing machines. D 23. 546
- 488 Curtis & Mitchell, Boston, Mass.—Paper cutters, self-inking printing presses, card cutters, etc. D 24. 546
- 489 Sheridan, E. R., & T. W., New York, N. Y.—Paper cutters, book trimmer, shears, presses, sawing machine, etc. D 25. 546
- 490 Packer, Charles W., Philadelphia, Pa.—Machines for cutting card board. D 25. 546
- 491 Vanhorn & Cranston, Brooklyn, N. Y.—Paper-cutting machines. E 26. 546
- 492 Lockwood, W. E., & E. D., Philadelphia, Pa.—Automatic envelope and paper collar machines. D 27. 547
- 493 Hoole, John R., New York, N. Y.—Perforating machine for checks, stamps, tickets, etc.; paging machine, for numbering books, tickets, etc. F 34 to 36. 547
- 494 Cohen, Chas. J., Philadelphia, Pa.—Machine for folding, gumming, and finishing self-sealing envelopes. D 26. 547

Motors and Apparatus for the Generation and Transmission of Power.

- 495 Williamson Brothers, Philadelphia, Pa.—Portable and stationary hoisting engines, with spur and frictional gearing. D 79, and boiler house. 550
- 496 Tupper, Lorenzo B., New York, N. Y.—Furnace grate bars. D 76. 550
- 497 Connery, James W., Philadelphia, Pa.—Concave calking for steam boilers, iron ships, and metallic vessels. D 76. 550
- 498 Tupper, W. W., & Co., New York, N. Y.—Grates for steam boiler furnaces, etc. D 75. 550
- 499 Frick & Co., Waynesborough, Pa.—Portable farm and stationary engines. D 75, and boiler house. 550
- 500 Bigelow, H. B., & Co., New Haven, Conn.—Combined and independent engines and boilers. D 71. 550
- 501 Steam Generator Manufacturing Co. of Pennsylvania, Philadelphia, Pa.—Sectional boiler. (Boiler house.) 550
- 502 American Engine Co., Jersey City, N. J.—Engines and thresher locomotive. D 75. 550
- 503 Shaw, Thomas, Philadelphia, Pa.—Steam and vacuum gauges, test pumps, air chamber feeder, hydraulic valves and gauges. D 6j. 550

Boilers, Engines, Water-Wheels.

- 504 Reed, John A., New York, N. Y.—Tapering corrugated sectional boilers. D 77. 550
- 505 Steigert, Leopold, Cincinnati, Ohio.—Meat-chopping machines, with engine attachments, horizontal engine. D 78. 550
- 506 Bent, Samuel S., New York, N. Y.—Shaking grate bars for steam boilers, etc. E 75. 550
- 507 Harrison Boiler Works, Philadelphia, Pa.—Sectional safety steam boiler. D 77, and boiler house. 550
- 508 Babcock & Wilcox, New York, N. Y.—Sectional safety steam boiler. (*Boiler house.*) 550
- 509 Meissner, Julius H., Philadelphia, Pa.—Shelving grates and furnaces. E 76. 550
- 510 Shore Bros., Philadelphia, Pa.—Boiler feed, belt pumps, steam pump. E 75. 550
- 511 Houghton, R. J., New York, N. Y.—Boiler and tube compound for removing and preventing scale; specimens of scale. E 76. 550
- 512 Snyder, Ward B., New York, N. Y.—Steam engine. B 71. 550
- 513 Howard Safety Boiler Manufacturing Co., Boston, Mass.—Safety sectional wrought-iron nine-inch tube boiler. (*Boiler house.*) 550
- 514 Ames Iron Works, Oswego, N. Y.—Portable steam engines. B 73, and boiler house. 550
- 515 Rawson & Hittinger, Cambridgeport, Mass.—Portable hoisting and horizontal engines. B 73, and boiler house. 550
- 516 Erie City Iron Works, Erie, Pa.—Horizontal tubular boiler, portable engines, farm engine with vertical boiler and horizontal engine. C 76. 550
- 517 Ryder Reciprocal Grate Association, Taunton, Mass.—Reciprocal grates. D 68. 550
- 518 Lowe & Watson, Bridgeport, Conn.—Steam boiler. (*Boiler house.*) 550
- 519 Chalmers Spence Co., Philadelphia, Pa.—Composition boiler and steam pipe covering; tube cleaner. D 78. 550
- 520 Shuster, John T., Philadelphia, Pa.—Boiler and pipe covering. D 78. 550
- 521 Murrill & Keizer, Baltimore, Md.—Automatic damper regulator for steam boilers. D 64. 550
- 522 Baird & Huston, Philadelphia, Pa.—Horizontal tubular boiler. D 38 to 40. 550
- 523 Exeter Machine Works, Boston, Mass.—Sectional independent expansion and contraction boiler. (*Pump annex.*) 550
- 524 Hoadley Co., J. C., Lawrence, Mass.—Portable steam engines. D 80. 550
- 525 Kelley, Wm. E., New Brunswick, N. J.—Sectional safety boiler. (*Pump annex, and boiler house.*) 550
- 526 Lovegrove & Co., Philadelphia, Pa.—Vertical tubular boilers. B 75, and boiler house. 550
- 527 Armstrong Heater Manufacturing Co., Toledo, Ohio.—Improved heater, lime extractor, condenser, adjustable feed pump for steam boilers. D 74. 550
- 528 Guynan, R. B., Philadelphia, Pa.—Log, circulating, and pneumatic beer boilers. D 74. 550
- 529 Ellis, Charles R., New York, N. Y.—Hot-water apparatus for heating buildings. D 75. 550
- 530 Haskins Steam Engine Co., Fitchburg, Mass.—Interchangeably-made engines. C 74, and boiler house. 550
- 531 Kreider, Campbell, & Co., Philadelphia, Pa.—Horizontal steam engine. E 50. 550
- 532 American Road Steamer Co., Philadelphia, Pa.—Road Steamer. E 80. 550
- 533 Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn.—Incrustation, scale, and defective iron from steam boilers, fragments of exploded boilers. D 76. 550
- 534 Colt's Patent Fire Arms Manufacturing Co., Hartford, Conn.—Steam engines, steam cylinder in boiler, interchangeable parts. D 74, and boiler house. 550
- 535 Sample, McElroy, & Co., Keokuk, Iowa.—Semi-portable steam engine and boiler. D 77. 550
- 536 Payne, B. W., & Sons, Corning, N. Y.—Vertical engines with safety boilers. (*Boiler house.*) 550
- 537 Andrus & Wallace, Keokuk, Iowa.—Feed water purifier for steam boilers, etc. (*Pump annex.*) 550
- 538 Vail, S. S., Keokuk, Iowa.—Reversible steam boiler, boiler for cooking, in vacuum or open, with cleaner. D 77. 550
- 539 Lynde, J. D., Philadelphia, Pa.—Safety boiler. B 71, and boiler house. 550
- 540 Sharts, Theodore, New York, N. Y.—Furnace-grate bars. (*Annex.*) 550
- 541 Smith, Charles D., Boston, Mass.—Water gauge for steam boilers. C, and boiler house. 550
- 542 Gillis & Geoghegan, New York, N. Y.—Boiler feeder and steam trap. (*Boiler house.*) 550
- 543 Harrold, George W., Rochester, N. Y.—Automatic steam trap. D 64. 550
- 544 Johns, H. W., New York, N. Y.—F 64. 550
a Asbestos roofing, asbestos cement felting, lined hair felt. 228
b Asbestos steam packing. 555
- 545 Skinner & Wood, Erie, Pa.—C 78. 550
a Flue boiler. 550
b Portable engine. 552
- 546 Sellers, William, & Co., Philadelphia, Pa.—C 18-25, and annex. 550
a Injectors. 550
b Three cylinder engines. 552
c Shafting, hangers, couplings. 553
- 547 Haworth, James, Philadelphia, Pa.—Turbines, driven by hydrant-water power. D 73. 551
- 548 Lane Manufacturing Co., Montpelier, Vt.—Monitor turbine water-wheel. A 35-37. 551
- 549 Grier, W. W., Hulton, Pa.—Hydraulic ram sentinel. D 79. 551
- 550 Stout, Mills, & Temple, Dayton, Ohio.—Turbine water-wheels with and without flumes. D 80. 551

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- 551 Stilwell & Bierce Manufacturing Co., Dayton, Ohio.—Double turbine water-wheel. D 80. 551
- 552 Dexter Spring Co., Hulton, Pa.—Carriage spring, in connection with fifth wheel. D 79. 551
- 553 Leffel, James, & Co., Springfield, Ohio.—Double turbine water-wheel. D 77. 551
- 554 Chase Turbine Manufacturing Co., Orange, Mass.—Turbine wheels. (*Pump annex.*) 551
- 555 Wolf, Abraham N., Allentown, Pa.—Turbine water-wheel and flume. (*Pump annex.*) 551
- 556 Buzby, Albert G., Philadelphia, Pa.—Water-motor from hydrant pressure; model of centripetal railway. D 79. 551
- 557 Bodine Manufacturing Co., Mt. Morris, N. Y.—Brass turbine water-wheel. D 79. 551
- 558 Valentine, Wm. J., Fort Edward, N. Y.—Turbines, with and without register gates; hydraulic motor. D 79. 551
- 559 Wright & Rogers, Minneapolis, Minn.—Stationary, portable, locomotive, and marine steam engines. D 79. 551
- 560 Mosser, Wm. F., & Co., Allentown, Pa.—Turbine water-wheel. A 48, and *pump annex.* 551
- 561 Hartford Pump Co., Hartford, Conn.—Compressed air pump. (*Pump annex.*) 551
- 562 Todd, John, Allentown, Pa.—Turbine water-wheel. D 77. 551
- 563 Bing, James, Philadelphia, Pa.—Turbine water-wheel. E 77. 551
- 564 Poole & Hunt, Baltimore, Md.—Turbine water-wheels and gearing. C 79. 551
- 565 Cox & Sons, Bridgeton, N. J.—Turbine water-wheels. C 32. 551
- 566 York Manufacturing Co., York, Pa.—Turbine water-wheels. D 78. 551
- 567 National Water-Wheel Co., Bristol, Conn.—Turbine water-wheels. D 77. 551
- 568 Barber & Son, Allentown, Pa.—Globe flume, with turbine wheel. D 77. 551
- 569 Brown, Son, & Co., Brookville, Pa.—Turbine water-wheels. D 78. 551
- 570 Cope, E. T., & Sons, West Chester, Pa.—Turbine water-wheel, with water-tight gates opening separately. (*Pump annex.*) 551
- 571 Bollinger, O. T., York, Pa.—Turbine water-wheel. (*Pump annex.*) 551
- 572 Risdon, T. H., & Co., Mount Holly, N. J.—Turbine water-wheel. (*Pump annex.*) 551
- 573 Walton, Silas, Moorestown, N. J.—Turbine water-wheel. (*Pump annex.*) 551
- 574 Alcott, Thos. J., Mount Holly, N. J.—Turbine water-wheel. D 78. 551
- 575 Tait, Thomas, Rochester, N. Y.—Water-wheel. (*Pump annex.*) 551
- 576 Knowlton & Dolan, Logansport, Ind.—Turbine water wheel. (*Pump annex.*) 551
- 577 Folsom, Andrew, Barrington, R. I.—Wheel constructed to operate in the direction of wind or water. (*Pump annex.*) 551
- 578 Peirce, Milton P., Wenonah, N. J.
a Turbine water-wheel. C 80. 551
b Portable steam engine. D 78, and *boiler house.* 552
- 579 Abendroth & Root Manufacturing Co., New York, N. Y.—Wrought iron sectional safety boiler. (*Boiler house.*) 552
- 580 Fields, Wm., Wilmington, Del.—Motor-power model-dumping coal wagon. B 79. 552
- 581 Bolles, J. N., Baltimore, Md.—Steam engine. A 56, and *outside.* 552
- 582 Cobb, Z., & Sons, Wilmington, Del.—Water engine for sewing machines, etc. E 63. 552
- 583 Wetherill, Robt., & Co., Chester, Pa.—Steam engine, with self-packing piston. B 69. 552
- 584 Baird & Huston, Philadelphia, Pa.—Steam engines. D 38-40. 552
- 585 Lobdell Car Wheel Co., Wilmington, Del.—Portable steam engine and boiler. E 65. 552
- 586 Cornell University Machine Shop, Ithaca, N. Y.—Steam engine. B 63. 552
- 587 Rider, Wooster, & Co., Walden, N. Y.—Compression engines, operating with valves, using compressed and heated air. B 80. 552
- 588 Lovegrove & Co., Philadelphia, Pa.—Steam engine. B 75, and *boiler house.* 552
- 589 Seigneuret, H. J., Henderson, Minn.—New motive power. E 40. 552
- 590 Middleton, John W., Philadelphia, Pa.—Non-explosive steam and atmospheric engines, air-contraction and expansion engine. C 77. 552
- 591 Wardwell, George J., Rutland, Vt.—Stationary and portable valveless steam engines. B 77. 552
- 592 Moorhouse, R. O., & Co., Philadelphia, Pa.—Steam engine, with gear for variable expansion adjusted by the governor. B 73. 552
- 593 Hawley, Henry Q., Albany, N. Y.—C 75.
a Water motors. 551
b Gas heating and cooking furnaces. 552
- 594 Buckeye Engine Co., Salem, Ohio.—Automatic cut-off and throttling steam engines. B 70. 552
- 595 Hussey, Charles A., New York, N. Y.—Electro-magnetic engines. E 69. 552
- 596 Gladwin, Charles P., Philadelphia, Pa.—Plain-slide valve steam engines with governor and automatic stop and speeder. B 71, and C 77. 552
- 597 Lidgerwood Manufacturing Co., New York, N. Y.—Hoisting and elevating engines. B 79, and *annex.* 552
- 598 Mansfield Machine Works, Mansfield, Ohio.—Stationary engine, with balance steam valves. B 71. 552
- 599 Shapley & Wells, Binghamton, N. Y.—Steam engines. D 79, and *boiler house.* 552

Engines, Belting, Etc.

- 600 Mitchell, J. H., Philadelphia, Pa.—Steam engines. B 80. 552
- 601 New York Safety Steam Power Co., New York, N. Y.—Launch engines, stationary engine, combined engine and boiler. E 38-40. 552
- 602 Lynde, J. D., Philadelphia, Pa.—Duplex engine. B 71, and boiler house. 522
- 603 Naylor, Jacob, Philadelphia, Pa.—Engines, horizontal and vertical boiler feed pump, and combined feed pump and heater. D 71-73. 552
- 604 Winkler, Gustavus R., Williamsport, Pa.—Rotary engine. B 76. 552
- 605 Copeland & Bacon, New York, N. Y.—Reversible winding engine, and differential geared hoisting engine. E 78, and boiler house. 552
- 606 McCutchen, John F., Philadelphia, Pa.—Block for eccentric hooks of steam engine. B 77. 552
- 607 Meeker, D. M., & Sons, Newark, N. J.—Part of cylinder of the first steam engine used in America. B 76. 552
- 608 Griffith & Wedge, Zanesville, O.—Vertical portable engine. D 77. 552
- 609 Klein, Chas. C., Philadelphia, Pa.—Eccentric piston engine. C 74. 552
- 610 Jeffery, Thos. B., Chicago, Ill.—Rotary steam engines. B 77. 552
- 611 Hartford Foundry and Machine Co., Hartford, Conn.—Automatic and variable cut-off non-condensing steam engine. (*Annex.*) 552
- 612 Twiss, Nelson W., New Haven, Conn.—Vertical engine, yacht engine. C 79. 552
- 613 Blandy, H. & F., Zanesville, Ohio.—Portable, agricultural, and saw-mill engines, and stationary engine. B 68. 552
- 614 Erie City Iron Works, Erie, Pa.—Stationary engine, horizontal engine. C 76. 552
- 615 Otis Bros. & Co., New York, N. Y.—Furnace engine for hoisting purposes. B 38. 552
- 616 Bastet Magnetic Engine Co., Philadelphia, Pa.—Magnetic engines for sewing machines, organs, lathes, pumps, etc. B 75. 552
- 617 Wells Balance Engine Co., New York, N. Y.—Double piston engine. C 77. 552
- 618 Niagara Steam Pump Works, Brooklyn, N. Y.—Miniature engine. (*Pump annex.*) 552
- 619 Brown, C. H., & Co., Fitchburg, Mass.—Automatic regulating cut-off steam engine. (*Saw mill.*) 552
- 620 Howard, George C., Philadelphia, Pa.—Belt gearing for sewing machines. B 31. 553
- 621 Forepaugh, Wm. F., jr., & Bros., Philadelphia, Pa.—Leather-rolling machine. D 66. 553
- 622 Eckfeldt & Richie, Philadelphia, Pa.—Oak-tanned leather butts, belting and fire hose. D 65. 553
- 623 Page Belting Co., Concord, N. H.—Leather belting and lace leather; driving belt (in use). D 64. 553
- 624 Roebling's Sons, John A., & Co., Trenton, N. J.—Wire rope, rigging, rope fastenings, bridge cables, rods, telegraph wire, etc. C 64. 553
- 625 Alexander Brothers, Philadelphia, Pa.—Oak-tanned leather belting, samples; driving belt (in use). D 64. 553
- 626 Cresson, Geo. V., Philadelphia, Pa.—Pulleys, hangers, couplings, wall boxes, pillow blocks, etc. C 71-73. 553
- 627 Heim, Anton, New York, N. Y.—Leather belting, hydraulic packing leather, tympan skins, lacc leather, picker leather, elastic pulley; driving belt (in use). C 71. 553
- 628 Branch, Crookes, & Co., St. Louis, Mo.—Adjustable countershaft hanger and belt tightener. (*Saw mill.*) 553
- 629 Rorer, Thomas I., Philadelphia, Pa.—Combined leather and canvas belting. D 65. 553
- 630 American Tubular Iron and Steel Association, Philadelphia, Pa.—Tubular iron and steel car axles, shafting, columns, bars. C 70-73. 553
- 631 Pennsylvania Combined Iron and Steel Association, Philadelphia, Pa.—Combined iron and steel rails, beams, girders, shafting plates, horse shoe and merchant bars. C 70-73. 553
- 632 Jones & Laughlins, Pittsburg, Pa.—Bar, sheet, and plate iron, T-rails, shafting, hangers, pulleys, couplings. C 65 and 70. 553
- 633 Schieren, Charles A., New York, N. Y.—Oak-tanned leather belting; double belt (in use). D 64. 553
- 634 Charlton, John, Philadelphia, Pa.—Internal clamp coupling for shafting, main driving pulley, with internal clamp hub. C 71 and 73. 553
- 635 Hoyt, J. B., & Co., New York, N. Y.—Oak-tanned sole leather and belting. D 69. 553
- 636 Royer, H., San Francisco, Cal.—Fulled rawhide, belting, lacing, rope. D 66. 553
- 637 Charfield, Underwood, & Co., New York, N. Y.—Angular belting. D 65. 553
- 638 New Jersey Car Spring and Rubber Co., Jersey City, N. J.—Rubber belting and packing. C 74. 553
- 639 Jewell, P., & Sons, Hartford, Conn.—Leather belting, metallic-tipped belt lacings. D 67. 553
- 640 Mason, Volney W., & Co., Providence, R. I.—Friction clutches and pulleys, adjustable hangers. D 66, and pump annex. 553
- 641 Poole & Hunt, Baltimore, Md.—Shafting and appurtenances. C 79. 553
- 642 Gates, Josiah, & Sons, Lowell, Mass.—Leather belting, hose, lacing, and worsted apron leather and fire supplies. C 78. 553
- 643 Burgess & Son, Providence, R. I.—Leather belting, lace leather, picker leather, loom pickers. C 70. 553
- 644 Cook, A. B., & Co., Erie, Pa.—Adjustable dead pulleys, wooden belt pulleys, and taper sleeve pulleys. D 72. 553
- 645 Wright, James W., Minneapolis, Minn.—Propeller engine model. (*Annex.*) 554

Motor Appliances.

- 646 Brown, Edward, Philadelphia, Pa.—Pyrometers for blast furnaces, bakers' ovens, tempering steel, etc.; revolution indicators. D 65. 555
- 647 Woodruff, Joseph, Rahway, N. J.—Balanced steam damper regulator. D 16. 555
- 648 Wickersham & Bro., Philadelphia, Pa.—Oil feeder, brass and glass oil cups. D 76. 555
- 649 Pancoast & Maule, Philadelphia, Pa.—Steam and hot water house heating apparatus, vertical tube radiators, pipe cutter. D 75. 550
- 650 New York Belting and Packing Co., New York, N. Y.—Rubber belting, packing, hose, tubing, car springs, vulcanite emery wheels, etc. D 75. 555
- 651 Sykes, L., & Son, Philadelphia, Pa.—Bolts, nuts, washers, car trucks, roof trusses, bridges, track bolts, choru links, forgings, etc. D 70. 555
- 652 Belfield, H., & Co., Philadelphia, Pa.—Brass and iron valves, cocks, steam gauges, whistles, gongs, steam fitting apparatus, etc. D 74. 555
- 653 Allen's Sons, Josiah J., Philadelphia, Pa.—Anti-lamina, for preventing and removing scale from boilers. D 76. 555
- 654 Stilwell & Bierce Manufacturing Co., Dayton, Ohio.—Lime extracting heater and filter. D 80. 555
- 655 Shive Governor Co., Bethlehem, Pa.—Governor, combination spring motor, watchman's register, clock and time detector. D 69. 555
- 656 Waters, C., & Co., Boston, Mass.—Steam engine governors. D 74. 555
- 657 Buffalo Steam Gauge and Lantern Co., Buffalo, N. Y.—D 72. 555
a Steam gauges. 555
b Locomotive head light with patent burner, hand lantern. 576
- 658 Lehman, B. E., Bethlehem, Pa.—Gauge cocks, water gauges, oil cups, gate valves. D 70. 555
- 659 American Oil Cabinet Co., Boston, Mass.—Safety oil cabinets. D 72. 555
- 660 Lyman, A. E., & Wife, Brooklyn, N. Y.—Metallic packing, for steam cylinders. B 57. 555
- 661 Utica Steam Gauge Co., Utica, N. Y.—Gauges, marine clocks, revolution counters, gauge testing apparatus. D 73. 555
- 662 Cleveland Steam Gauge Co., Cleveland, Ohio.—Gauges, spring balances, test pump and gauge. D 72. 555
- 663 Aultman, Miller, & Co., Akron, Ohio.—Self-registering dynamometer. D 68. 555
- 664 Davis & DuBois, Philadelphia, Pa.—Tallow cups for engines, etc. D 68. 555
- 665 Lynde, J. D., Philadelphia, Pa.—Governors, valves, feed water heaters, regulators and low water alarm combined. B 71, and boiler house. 555
- 666 Union Water Meter Co., Worcester, Mass.—Water meters, steam gongs, governor valves, steam and water regulators. B 70. 555
- 667 Kline, Aaron K., Sommerville, N. J.—Governor for steam engines. D 69. 555
- 668 Haurey, Henry F., Newark, N. J.—Flue and tube brushes. D 69. 555
- 669 Jenkins, Wm. H., & Co., Philadelphia, Pa.—Boiler feeder, steam trap, damper regulator, low water alarm, safety valve, steam gauges. D 77. 555
- 670 Williams, E. A., & Son, Jersey City, N. J.—Anti-friction and diamond metals, brass castings. D 75. 555
- 671 Post & Co., Cincinnati, Ohio.—D 71. 555
a Steam gauges. 555
b Railway passenger-car trimmings, locomotive head-lights. 576
- 672 Greenwich Machine Works, Greenwich, N. Y.—Water-wheel governor. A 30. 555
- 673 Tracy, Eliashib, Philadelphia, Pa.—Injector for boilers. D 68. 555
- 674 Hartford Governor Co., Hartford, Conn.—Water-wheel governor. D 69. 555
- 675 Lathrop Anti-friction Co., New York, N. Y.—Carbon composition machinery lubricator. D 68. 555
- 676 Asbestos Patent Fibre Co., Philadelphia, Pa.—Fibre, yarn, paper, board. D 69. 555
- 677 Davis, J. B., Hartford, Conn.—Feed water heater and purifier. D 68. 555
- 678 Metallic Brush Co., Boston, Mass.—Machine for making metallic brushes. D 68. 555
- 679 Brown, Fergus, & Co., Philadelphia, Pa.—Injector. (*In use in building.*) 555
- 680 Brown & Fergus, Philadelphia, Pa.—Steam injector for steam boilers. (*In building.*) 555
- 681 Le Van, W. Barnet, Philadelphia, Pa.—Steam engine governors, damper regulator, and furnace grate bars. D 70. 555
- 682 Willoughby, James D., Philadelphia, Pa.—Governor for steam engines. D 68 and 51, and pump annex. 555
- 683 Woodruff, A. H., Lansing, Iowa.—Reverse and expansion gear for locomotives and propeller engines. D 69. 555
- 684 Snyder, Henry, & Co., Philadelphia, Pa.—Tube and flue brush. D 73. 555
- 685 Newell, Wm. H., Philadelphia, Pa.—Injector valves. (*In building.*) 555
- 686 Allen, Stillman B., Boston, Mass.—Governor for steam engines. D 72. 555
- 687 Osgood, Josiah A., Boston, Mass.—Crank pin oiler, metallic spring packing, etc. D 69. 555
- 688 McNab & Harlin Manufacturing Co., New York, N. Y.—Valves, cocks, whistles, water gauges, iron fittings, plumbers' materials. B 40. 555
- 689 Edson Gauge Manufacturing Co., New York, N. Y.—Gauges, electrical alarms, revolution counters. D 67. 555
- 690 Schutte & Goehring, Philadelphia, Pa.—Steam jet machinery, furnace blowers, ventilators, injectors, syphons, gas exhausters, condensers, etc. (*Pump annex.*) 555
- 691 Lonergan & McBride, Philadelphia, Pa.—Oil cups and lubricators. D 66. 555

Pumps, Engines.

- 692 Silver Lake Co., Boston, Mass.—Self-lubricating steam packing. D 68. 555
- Hydraulic and Pneumatic Apparatus, Pumping, Hoisting, and Lifting.**
- 693 Dart, Edward & Co., New York, N. Y.—Rotary pumps and engines, marine governors, cotton gins, presses, duplex plunger crank steam pump. (*Pump annex.*) 560
- 694 Cooper, Jones, & Cadbury, Philadelphia, Pa.—Pumps. B 19. 560
- 695 Silsby Manufacturing Co., Seneca Falls, N. Y.—Rotary steam pump. A 4. 560
- 696 Valley Machine Co., Easthampton, Mass.—Bucket-plunger steam pumps. (*Pump annex.*) 560
- 697 Kelly, Wm. E., New Brunswick, N. J.—Steam pumps. (*Pump annex and boiler house.*) 560
- 698 Aquometer Steam Pump Co., Philadelphia, Pa.—Steam pumps. (*Pump annex.*) 560
- 699 Hubbard & Aller, Brooklyn, N. Y.—Steam pumps. (*Pump annex.*) 560
- 700 Union Manufacturing Co., New Britain, Conn.—Iron and brass cistern; force, yard, drive well; garden engines, boiler, pumps, and rams. (*Pump annex.*) 560
- 701 Wiswall, H. M., Boston, Mass.—Rotary and oscillating pumps. (*Pump annex.*) 560
- 702 Norwalk Iron Works Co., South Norwalk, Conn.—Direct acting non-expansive steam pumps. C 76. 560
- 703 La France Manufacturing Co., Elmira, N. Y.—P 11, and *pump annex.*
a Rotary pumps and engine. 560
b Rotary steam fire engine. 564
- 704 Rumsey & Co. (Limited), Seneca Falls, N. Y.—Pumps, hydraulic rams. B 45, and *pump annex.* 560
- 705 Carr, Adam, New York, N. Y.—Steam pump, steam radiator, hoisting engine, condensers. (*Pump annex and boiler house.*) 560
- 706 Douglas, W., & B., Middletown, Conn.—Pumps, hydraulic rams, pump chain, garden engines, curbs, chain pump fixtures; grindstone frame. (*Pump annex.*) 560
- 707 Vail & Wallace, Keokuk, Iowa.—Water elevator. (*Pump annex.*) 560
- 708 Mitchell, J. H., Philadelphia, Pa.—Deck pump for ship use. B 80. 560
- 709 Hooker, Wm. D., Dedham, Mass.—Direct acting steam pumps. (*Pump annex.*) 560
- 710 Cotter, C. S., Ravenna, Ohio.—Force and cistern pumps, etc. (*Pump annex.*) 560
- 711 Follensbee, Geo. S., Lewistown, Maine.—Double propeller pump. (*Pump annex.*) 560
- 712 Grosvenor, J. A., Jersey City, N. J.—Pulsometer steam pump, operated by pressure of steam on surface of water. (*Pump annex.*) 560
- 713 Biggs, B. F., & Wells, La Fayette, Ind.—Wooden lifting and suction pump. (*Pump annex.*) 560
- 714 King, Charles W., Boston, Mass.—Force pumps and house pumps with removable cylinders. (*Pump annex.*) 560
- 715 White, Clark, & Co., Baldwinsville, N. Y.—Centrifugal pump. (*Pump annex.*) 560
- 716 Poole & Hunt, Baltimore, Md.—Feed water heater and pump. C 79. 560
- 717 Willoughby, James D., Philadelphia, Pa.—Steam pump. D 51 and 68, and *pump annex.* 560
- 718 Bradley, J., & Co., Philadelphia, Pa.—Odorless excavating apparatus. (*Pump annex.*) 560
- 719 Gawthrop, A., & Son, Wilmington, Del.—Glass models of hydraulic rams with regulators, in operation. (*Pump annex.*) 560
- 720 Huffer, Abraham, Hagerstown, Md.—Automatic steam vacuum pump. (*Pump annex.*) 560
- 721 Pease, F. S., Buffalo, N. Y.—Pneumatic pump. (*Pump annex.*) 560
- 722 Colton, G. D., Galesburg, Ill.—Steam vacuum lifting and forcing pumps. (*Pump annex.*) 560
- 723 Bagley & Sewall, Watertown, N. Y.—Metal force pump with self-packing joints. (*Pump annex.*) 560
- 724 Niagara Steam Pump Works, Brooklyn, N. Y.—Direct acting steam pump and crank pump. (*Pump annex.*) 560
- 725 Hydrostatic and Hydraulic Co., Philadelphia, Pa.—Compound propeller pump for quarries, mines, etc. (*Pump annex.*) 560
- 726 Conde & Co., Philadelphia, Pa.—Steam pumping engine. (*Pump annex.*) 560
- 727 Nye, Gourlay, & Co., Chicago, Ill.—Steam vacuum pump. (*Pump annex.*) 560
- 728 Hanson, Thomas, New York, N. Y.—(*Pump annex.*)
a Steam and hydraulic pumps and rams. 560
b Hydraulic organ blowing engine. 562
- 729 Gruber, John P., Jersey City, N. J.—A 52.
a Filtering apparatus, liquid elevators. 560
b Air-compressor and engine pressure regulator. 561
- 730 Sluthour & Mintzer, Philadelphia, Pa.—(*Pump annex.*)
a Force and bilge hand pumps. 560
b Fire engines. 564
- 731 Albright & Stroh, Mauch Chunk, Pa.—B 19.
a Model of duplex steam pump. 560
b Fire-plugs. 566
- 732 Allison & Bannan, Port Carbon, Pa.—Air compressing engines. A 52. 561
- 733 Coffin & Woodward, Boston, Mass.—Main and bilge pump for vessels, force pump. D 39. 562
- 734 Roots, P. H., & F. M., Connersville, Ind.—Rotary pressure blowers, hand blowers, gas exhauster. (*Pump annex.*) 562

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- 737 Morris Co., I. P., Philadelphia, Pa.—Blowing engine, blowing cylinder, steam cylinder, stroke of piston. B 48. 562
- 738 Roddey, P. D., & Co., New York, N. Y.—Ship ventilator, fog alarm, bilge pump. (*Pump annex.*) 562
- 739 Constant Protective Ventilator Co., New York, N. Y.—Ventilators. E 29. 562
- 740 Murphy, Francis, Streator, Ill.—Ventilating apparatus for mines, tunnels, steamboats, etc. (*Pump annex.*) 562
- 741 Disston, Thomas S., Philadelphia, Pa.—Rotary pressure blower. (*Pump annex.*) 562
- 742 Van De Mark, A. B., New York, N. Y.—Balanced rotary engine, blower, and pump. (*Pump annex.*) 562
- 743 Chase, Frederic D., Boston, Mass.—Brass, composition, and iron ventilating ship deck irons. (*Pump annex.*) 562
- 744 Weiner, P. L., Lebanon, Pa.—Blowing engine. B 69. 562
- 745 Exeter Machine Works, Boston, Mass.—Pressure blowers, fan blowers, and exhaust fans. (*Pump annex.*) 562
- 746 Howard, George C., Philadelphia, Pa.—Hoisting machine. B 31. 563
- 747 Gunpowder Pile Driver Co., Philadelphia, Pa.—Pile driver. (*Outside of building.*) 563
- 748 Ruoff, William, Philadelphia, Pa.—Double and single geared jack screws. (*Pump annex.*) 563
- 749 Stewart, Ralph, & Co., Philadelphia, Pa.—Packing machines. D 23. 563
- 750 Eccles, James, Philadelphia, Pa.—Quadruple screw-power press, pivot centre for draw bridge, etc. (*Pump annex.*) 563
- 751 Sternberger, Leopold, Philadelphia, Pa.—Safety screw steam platform elevator. (*Pump annex.*) 563
- 752 Harrison, W. H., Philadelphia, Pa.—Double-acting two-valve pump. (*Pump annex.*) 563
- 753 Austin, Thomas K., New York, N. Y.—Automatic hand passenger elevator. (*Pump annex.*) 563
- 754 Bolen, Crane, & Co., Newark, N. J.—Compound hydraulic press. (*Pump annex.*) 563
- 755 Eagle Meter Co., New York, N. Y.—Water meter. (*Pump annex.*) 563
- 756 Archbold, Samuel, Philadelphia, Pa.—Liquid meters. (*Pump annex.*) 563
- 757 Castle, Wm. W., Belfast, Maine.—Lifting jack. (*Annex.*) 563
- 758 Taylor, John F., Charleston, S. C.—Steam and hydraulic cotton press. C 54-56. 563
- 759 Wright, James W., Minneapolis, Minn.—Glass cylinder water meter. D 79. 563
- 760 United Power-Press Co., New York, N. Y.—Hand- and power-presses. (*Pump annex.*) 563
- 761 Mason, Volney W., & Co., Providence, R. I.—Elevator hoisting machine and safety platform. D 66, and *pump annex.* 563
- 762 Williams, S. S., & Co., Philadelphia, Pa.—Hod elevator. (*Annex.*) 563
- 763 Goldmark, Joseph, New York, N. Y.—Safety elevators for hotels, dwellings, and warehouses, operated by steam, water, or hand power. A 40. 563
- 764 Robertson, John, & Co., Brooklyn, N. Y.—Hydraulic pumps, hydraulic presses. (*Pump annex.*) 563
- 765 Ross, Thos., Rutland, Vt.—Steam crane. (*Annex.*) 563
- 766 Randall, Francis M., New York, N. Y.—Automatic steam and vacuum pump. (*Pump annex.*) 563
- 767 Jones & Holmes, Providence, R. I.—Water elevators for open wells. (*Outside of building.*) 563
- 768 Bates, James, Baltimore, Md.—Hand elevator. (*Pump annex.*) 563
- 769 Yale Lock Manufacturing Co., Stamford, Conn.—Safety hoisting machinery, friction clutches and brakes, differential pulleys, drilling braces, stud end cutter. C 78. (*Outside.*) 563
- 770 Foulds, Thomas, jr., Trevorton, Pa.—Water elevator. (*Pump annex.*) 563
- 771 Swasey & Warner, Hartford, Conn.—Water meter. (*Pump annex.*) 563
- 772 Baird, G. W., Washington, D. C.—Model of distilling apparatus for steamships. (*Pump annex.*) 563
- 773 Otis Bros., & Co., New York, N. Y.—Passenger elevator, including engine safety drum, etc. B 38. 563
- 774 Leonard & Silliman, Bridgeport, Conn.—Grain elevator. E 56. 563
- 775 Desper, W. E., & Co., Worcester, Mass.—Water meters. (*Pump annex.*) 563
- 776 Tatham & Brothers, New York, N. Y.—B 21.
a Safety apparatus for hoisting machines, 563
b Sheet lead and other metallic pipes, sheet lead. 566
- 777 Silsby Manufacturing Co., Seneca Falls, N. Y.—Rotary steam fire engines, horse and hand hose carts. A 6. 564
- 778 Grimshaw, R., Philadelphia, Pa.—Fire subduing appliances. B 41-43. 564
- 779 Straw, E. A., Manchester, N. H.—Steam fire engine. (*In use on grounds.*) 564
- 780 Schanz, C., Philadelphia, Pa.—Hook and ladder truck for firemen. B 54-56. 564
- 781 Champion Fire Extinguishing Co., Louisville, Ky.—Chemical engines, with hook, ladder, and hose attachments, hand fire extinguishers. B 56. 564
- 782 Babcock Manufacturing Co., New York, N. Y.—Chemical engines, hook and ladder trucks, truck and engine combined, fire extinguishers. D 25. 564
- 783 Platt, Wm. K., & Co., Philadelphia, Pa.—Fire extinguishers. B 49. 564

Fire Engines, Soda Apparatus, Tubing and Fittings.

- 784 Vose, Wm. T., Boston, Mass.—Hydropult, for extinguishing fires, washing and watering purposes. A 4. 564
- 785 Spawn, A. F., & Co., New York, N. Y.—Chemical fire engines, hose carriage, hook and ladder truck, firemen's supplies. B 64-66. 564
- 786 Haase, John A., Philadelphia, Pa.—Model of hose shield. B 41. 564
- 787 Nichols, B. S., & Co., Burlington, Vt.—Steam fire engine. (*Pump annex.*) 564
- 788 Gomersall, Alfred, Philadelphia, Pa.—Engines, pumps, model of hose carriage. C 79. 564
- 789 Greer, Samuel Y., Philadelphia, Pa.—Hand hose carriage, leather fire hose, leather fire buckets. B 50. 564
- 790 Walton Bros., New York, N. Y.—Fire extinguishers. D 25. 564
- 791 Rumsey & Co. (Limited), Seneca Falls, N. Y.—Hand fire engine. B 45. 564
- 792 Buttkeireit, Carl G., Des Moines, Iowa.—Upright bell piano. A 3. 564
- 793 Paterson Steam Fire Engine Works, Paterson, N. J.—Steam fire engine. B 68. 564
- 794 Dennisson, J. N., Newark, N. J.—Steam fire engine, portable waterworks. B 47. 564
- 795 Lamm, John, Port Deposit, Md.—Fire extinguisher. B 66. 564
- 796 New Jersey Car Spring and Rubber Co., Jersey City, N. J.—Rubber hose. C 74. 564
- 797 Thomas & Joerns, New York, N. Y.—Model of sectional and telescopic screw, for fire escape, and raising heavy weights. B 45. 564
- 798 Daniels, T. E., Detroit, Mich.—Fire escape and ladder. (*Annex.*) 564
- 799 Wannalansett Manufacturing Co., Boston, Mass.—Linen fire hose, hose reels, pipes, couplings, etc. A 41. 564
- 800 Clapp & Jones Manufacturing Co., Hudson, N. Y.—Piston steam fire engines. B 62. 564
- 801 Button, L., & Son, Waterford, N. Y.—Steam fire engine. D 54. 564
- 802 Zwietusch, Otto, Milwaukee, Wis.—B 24. 564
a Chemical fire extinguisher. 564
b Soda-water apparatus, beer preserver, etc. 565
- 803 Lippincott, Charles, & Co., Philadelphia, Pa.—Apparatus for manufacturing and dispensing soda-water and other aerated beverages. A 27, D 3, and B 61. 565
- 804 Bates, Benjamin, Baltimore, Md.—Copper and silver carbonaters, with attachments. A 20. 565
- 805 Warwick, Samuel H., Philadelphia, Pa.—Soda-water fountain. A 23. 565
- 806 Matthews, John, New York, N. Y.—Apparatus for making, bottling, and dispensing soda-water and aerated beverages. A 24. 565
- 807 Puffer, A. D., Boston, Mass.—Beer apparatus, soda and mineral-water apparatus. A 19. 565
- 808 Postens, Edward, Philadelphia, Pa.—Soda water and aerated beverages in bottles; apparatus and accessories. A 25. 565
- 809 Tufts, James W., Boston, Mass.—Soda water apparatus, generators, fountains, tumbler washers, etc. A 18. 565
- 810 Chapman & Co., Madison, Ind.—Portable soda fountain. A 28. 565
- 811 Fergus, James, & David, Philadelphia, Pa.—Machine for bottling and corking liquors. A 22. 565
- 812 Hey, Michael, Philadelphia, Pa.—Beer pump, with bar fixtures, water pressure machine, beer cooler, air bung and regulator. E 68. 565
- 813 Lalanc & Grosjean Manufacturing Co., New York, N. Y.—Seamless soda water fountains and generators of steel, sheet iron, copper, and glass. A 21. 565
- 814 Morris, Tasker, & Co., Philadelphia, Pa.—Wrought iron tubes, tools, and brass work. A 70, and C 27. 566
- 815 Kirk, Geo. R., Philadelphia, Pa.—Patent regulating cylinder lubricator, with gauge showing contents, brass cocks, and valves. B 19. 566
- 816 Woodruff & Beaumont, Kankakee City, Ill.—Stop valve. B 19. 566
- 817 Flower, James, & Bro., Detroit, Mich.—Stop valve, fire hydrant, machine for squaring nuts, oil cups. D 20. 566
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- 819 Warren Foundry and Machine Co., Phillipsburg, N. J.—Gas and water pipe. (*Outside of Machinery Building.*) 566
- 820 Mohawk and Hudson Manufacturing Co., Waterford, N. Y.—Straightway valves, garden hydrants, fire hydrants. B 21. 566
- 821 Dreyer, Simpson, & Co., Philadelphia, Pa.—Arrangement of steam and water pipes, in exhaust chamber. B 19. 566
- 822 Bridgewater Iron Co., Bridgewater, Mass.—Forgings, seamless copper and brass tubes, and bolts, chilled soft rolls, spikes, roll plates, metal sheathing, etc. B 22. 566
- 823 Gloucester Iron Works, Philadelphia, Pa.—Cast iron pipes, fire hydrants, stop valves, and lamp posts. B 26. 566
- 824 Spiral Tubing Co., Boston, Mass.—Spiral seam pipe, for speaking tubes, water conductors, stove pipe, etc. B 34. 566
- 825 National Tube Works Co., Boston, Mass.—Iron boiler tubes, iron hydraulic, steam, gas, water, and sewage pipes, enameled pipe, injector. E 74, and D 10. 566
- 826 Meyer, Henry C., & Co., New York, N. Y.—Faucets, anti-freezing hydrants, street washers, combined hitch post and street washer. B 27. 566
- 827 Crosby Steam Gauge and Valve Co., Boston, Mass.—Steam gauges and safety valves, hydraulic and vacuum gauges, etc. D 67. 566

Metal Fittings, Locomotives, Scales.

- 828 Cook & Pulver, New York, N. Y.—Lubricating cups, and lubricating compound. D 69. 566
- 829 Peet Valve Co., Boston, Mass.—Brass and iron steam valves. B 22. 566
- 830 Merrill & Keizer, Baltimore, Md.—Gauge cocks for steam boilers. D 64. 566
- 831 Wood, R. D., & Co., Philadelphia, Pa.—Fire hydrants, cast iron pipe, eddy valves, lamp posts, turbine wheels, duplex turbine. B 18, and *pump annex.* 566
- 832 Roots, P. H., & F. M., Connersville, Ind.—Tuyere irons and fire bed, bye pass, gas valves. (*Pump annex.*) 566
- 833 Allison, W. C., & Sons, Philadelphia, Pa.—Boiler tubes, oil-well tubing, steam pipe, rivets, bolts, nuts, washers, iron fittings, forgings. B 24. 566
- 834 Cooper, Jones, & Cadbury, Philadelphia, Pa.—Supplies for plumbers, steam fitters, and machinists, etc. B 19. 566
- 835 Merchant & Co., Philadelphia, Pa.—Seamless brass and copper tubes, sheet and planished copper, brass wire and tubing, tin plates. B 20. 566
- 836 Pounds, Wm. H., Philadelphia, Pa.—Brass work for plumbers' and gas-fitters' use, in operation. B 19. 566
- 837 Flagg, Stanley G., & Co., Philadelphia, Pa.—Fittings for gas, steam, and water pipes. A 41. 566
- 838 Ludlow Valve Manufacturing Co., Troy, N. Y.—Fire hydrants with valves partly of rubber, sliding stop valves. B 22. 566
- 839 Lunkenheimer, Fred., Cincinnati, Ohio.—Automatic lubricators and glass oil-cups, brass castings. B 21. 566
- 840 Stileman, R. T. H., Philadelphia, Pa.—Water gates, fire hydrants, and station valves. B 19. 566
- 841 Stephens, Melvin, New York, N. Y.—Cement-lined wrought iron water pipe. B 22. 566
- 842 J. L. Mott Iron Works, New York, N. Y.—Plumbers' cast iron ware, plain, galvanized, and enameled. B 25. 566
- 843 Walworth Manufacturing Co., Boston, Mass.—Steam cocks and valves. A 76, E 75, and B 41. 566
- 844 Radde, William, New York, N. Y.—Glass-lined iron pipe and fittings, underground telegraph system. B 20. 566
- 845 Chapman Valve Manufacturing Co., Boston, Mass.—Water, gas, and steam valves, with metal seats. B 20 and 40. 566
- 846 Jarecki Manufacturing Co., Erie, Pa.—Brass work for steam, gas, water, oil, and iron fittings, adjustable pipe tongs. B 20. 566
- 847 Starr, Jesse W., & Son, Camden, N. J.—Castings for gas and water, lamp posts, fire hydrants, stop valves, etc. (*Outside of building.*) 566
- 848 Colwell Lead Co., New York, N. Y.—Lead pipe, sheet lead, block tin pipe, tin-lined lead pipe. B 22-25. 566
- 849 Long, Dennis, & Co., Louisville, Ky.—Cast iron gas and water pipes. B 20. 566
- 850 Weir, Fred. C., Cincinnati, Ohio.—Telescopic fire hydrant. D 69. 566
- 851 O'Neill, Andrew, Ansonia, Conn.—Pipes. B 23, and *outside.* 566
- 852 Mills, Thomas, & Bro., Philadelphia, Pa.—Vertical engine and ice cream freezer combined, ice cream freezers and freezing apparatus. E 65. 568
- 853 Knickerbocker Ice Co., Philadelphia, Pa.—Ice tools, elevators, wagon, and ice machinery. B 18. 568
- 854 Low, David W., Gloucester, Mass.—Ice crushers. B 19. 568
- Railway Plant, Rolling Stock, and Apparatus.**
- 855 Burnham, Parry, Williams, & Co., Philadelphia, Pa.—Locomotives. E 41-43, and E 7. 570
- 856 Pease, James H., Reading, Pa.—Historical chart of inventions and improvements of the locomotive and railway system. E 71. 570
- 857 Rogers Locomotive and Machine Works, Paterson, N. J.—Locomotive engine, and tender. D 41, 42, 43. 570
- 858 Danforth Locomotive and Machine Co., Paterson, N. J.—Locomotives. D 28 and 41. 570
- 859 Wright, James W., Minneapolis, Minn.—Locomotive engine model. D 79. 570
- 860 Rowand, John R., Philadelphia, Pa.—Locomotive-power brake. E 48. 570
- 861 Porter, Bell, & Co., Pittsburg, Pa.—Narrow-gauge passenger locomotive and tender. E 44-46. 570
- 862 Shaw & Gray, South Boston, Mass.—Model showing method of balancing locomotive driving wheels. D 51. 570
- 863 Philadelphia and Reading Railroad Co., Philadelphia, Pa.—Locomotive and tender. D 44-47. 570
- 864 Dickson Manufacturing Co., Scranton, Pa.—Locomotive and mining machinery. E 49-53. 570
- 865 Pennsylvania Railroad Co., Altoona, Pa.—Locomotive built in 1831, baggage and passenger car combined (old style). (*Outside of Building.*) 570
- 866 Griggs, H. W., Milwaukee, Wis.—Working drawings of passenger locomotive, in ink. D 49. 570
- 867 Riehle Bros., Philadelphia, Pa.—Scales, testing machines, beams, rope-twisters, sand-sifters. E 54. 571
- 868 Fairbanks & Ewing, Philadelphia, Pa.—Scales, testing machines, etc. E 56-60. 571
- 869 Brandon Manufacturing Co., Brandon, Vt.—Railroad, merchandise, post-office, and other scales, beams and trucks. E 61-63, and D 8. 571
- 870 Dell, John C., Philadelphia, Pa.—Scales and weights. D 62. 571
- 871 Buffalo Scale Co., Buffalo, N. Y.—Platform and counter scales. D 54. 571
- 872 Shive Governor Co., Bethlehem, Pa.—Scales, egg beater. D 69. 571
- 873 Becker & Sons, New York, N. Y.—Balances and weights. D 51. 571

Scales, Railway Plant.

- 874 Meyers, F., Newark, N. J.—Scales. D 53. 571
- 875 Hitchcock, S. S., Des Moines, Iowa.—Scales. D 47. 571
- 876 Cleveland Scale Works Co., Cleveland, Ohio.—Railroad track scale, with indicator. D 60. 571
- 877 Chicago Scale Co., Chicago, Ill.—Weighing scales. D 58. 571
- 878 Reilly, C. Leslie, Philadelphia, Pa.—Cylinder beam scale. E 77. 571
- 879 Willoughby, James D., Philadelphia, Pa.—Notifying scales, frictionless scales. D 8 and 51. 571
- 880 Chatillon, John, & Sons, New York, N. Y.—Spring balances, self-adjusting scales, counter scales, scale beams. D 50. 571
- 881 Morton, Thos., New York, N. Y.—Spring balances. D 62. 571
- 882 Automatic Scale Co., Harrisburg, Pa.—Automatic scale for grain and feed. D 53. 571
- 883 Price, Lipsett, & Co., Philadelphia, Pa.—Railroad track scale, platform scales. E 76. 571
- 884 Spencer's Sons, I. S., Guilford, Conn.—Family scales, with dial indicator. E 77. 571
- 885 Gray, Solomon S., South Boston, Mass.—Automatic weighing scales. D 51. 571
- 886 Steinway & Sons, New York, N. Y.—Metal frames for pianofortes, pianoforte actions. D 49. 571
- 887 National Scale Co., Philadelphia, Pa.—Portable platform and counter scales. D 51. 571
- 888 Reinhardt, Chas., Brooklyn, N. Y.—Druggists', gold, and diamond scales. D 62. 571
- 889 Henderson Hydraulic Car Brake Co., Philadelphia, Pa.—Car brake, by steam or hydraulic pressure. D 64-66. 572
- 890 Lahaye, J. J., Reading, Pa.—Model cars with automatic couplings. D 64. 572
- 891 Barton, C. S., Philadelphia, Pa.—Railway station indicator, operated from engine by compressed air or by hand. D 64. 572
- 892 Gerard, Peter, Philadelphia, Pa.—Snow plow for locomotives, axle grease, oil. D 64. 572
- 893 Thompson, Thomas E., Philadelphia, Pa.—Automatic and momentum car brake. D 64. 572
- 894 Kline, Aaron K., Somerville, N. J.—Model of car coupling. D 69. 572
- 895 Nelson, Nels, Minneapolis, Minn.—Steam and air car brake, car coupler. D 65. 572
- 896 Bing, James, Philadelphia, Pa.—Brake shoe. E 77. 572
- 897 Westinghouse Air Brake Co., Pittsburg, Pa.—Automatic brakes, vacuum brakes, air compressors, speed indicators, engine governors, engine. D 67. 572
- 898 Cobb, Z., & Sons, Wilmington, Del.—Elliptic steel springs, for car seats and upholsterers, door springs. E 68. 573
- 899 Cayuta Wheel and Foundry Co., Waverly, N. Y.—Chilled wheels for cars and engines; specimens and tests. E 64. 573
- 900 Lobdell Car Wheel Co., Wilmington, Del.—New and old railroad car wheels, tires, castings, etc. E 65. 573
- 901 Ramapo Wheel and Foundry Co., Ramapo, N. Y.—Railroad car and engine wheels. E 70. 573
- 902 Culmer Spring Co., Pittsburg, Pa.—Springs for railway purposes. E 69. 573
- 903 Bryant, George B., Pottsville, Pa.—Car wheels, pulleys, vehicle hubs, etc. E 67. 573
- 904 French, A., & Co., Pittsburg, Pa.—Elliptic and spiral springs for cars and locomotives. E 71. 573
- 905 Miltimore Car Axle Co., New York, N. Y.—Railroad car truck. E 70. 573
- 906 Tryon, Geo. K., Son, & Co., Philadelphia, Pa.—Car and other bearings and articles of phosphor-bronze, composition, Babbitt and type metal. E 64. 573
- 907 Davenport, Fairbairn, & Co., Erie, Pa.—Engine and car wheels. E 70. 573
- 908 Miles, W. A., Copake Iron Works, Copake, N. Y.—Car wheels. E 68. 573
- 909 Middleton, N., & A., & Co., Philadelphia, Pa.—Railroad car springs with section of trucks. E 70. 573
- 910 Barnum Richardson Co., Lime Rock, Conn.—Salisbury iron ore, charcoal pig iron, cast chilled car wheels. E 71. 573
- 911 Standard Steel Works, Philadelphia, Pa.—Crucible steel locomotive and car wheel tires, castings, and forgings. E 72. 573
- 912 Midvale Steel Works, Philadelphia, Pa.—Locomotive tires. C 23. 573
- 913 Lang, Wm. Bailey, & Co., New York, N. Y.—Cast steel locomotive tires. F 70. 573
- 914 Whitney, A., & Sons, Philadelphia, Pa.—Car wheels and axles. E 72. 573
- 915 American Paper Car Wheel Manufacturing Co., Hudson, N. Y.—Coach, truck and car wheels, of paper, steel and iron combined. E 65. 573
- 916 New Jersey Car Spring and Rubber Co., Jersey City, N. J.—Car springs. C 74. 573
- 917 Sax & Kear, Pittston, Pa.—Steel-tired truck and car wheels, with cast iron centres. E 73. 573
- 918 Harrison, Samuel L., San Francisco, Cal.—Railroad car axle, with independent wheels. E 72. 573
- 919 Schoem, Wm. H., Wilmington, Del.—Locomotive, car, and wagon springs. E 67. 573
- 920 Nichols, Pickering, & Co., Philadelphia, Pa.—E 71.
a Railway elliptic, volute and spiral springs. 573
b Cast steel nut-lock washers. 574
- 921 Fields, Wm., Wilmington, Del.—Cast steel rails, made direct from iron ore. E 64. 573
- 922 McKee, Fuller, & Co., Catasauqua, Pa.—Railroad car wheels. D 65. 573

PURE IRISH LINENS.

ESTABLISHED 1830.

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Flax Spinning Co., Limited,

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Brown Ducks and Duck Coatings,
Canvas and French Elastic Ducks,
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Light Fronting Linen,
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SEWING COTTON MANUFACTURERS FROM A. D. 1870.

AGENTS IN THE UNITED STATES:

Messrs. WILSON & MERRILL, BOSTON.

Railway Plant, Machines for Agricultural Products.

- 923 Nashua Iron and Steel Co., Nashua, N. H.—Steel plates, tires, axles, shaftings, bars, and forgings; iron axles, bars, plates, car wheels, and forgings. E 66. 573
- 924 Hamilton Steeled Wheel Co., Philadelphia, Pa.—Car wheels and specimens of metal, process of manufacture. D c8. 573
- 925 Jersey City Wheel Foundry and Machine Works, Jersey City, N. J.—Elastic steel tired car wheels, chilled car wheels. D 68. 573
- 926 Raddin, John, Lynn, Mass.—Elastic car and carriage wheels, automatic brakes, compensating wheels, bunters, elastic chains, etc. D 63. 573
- 927 Fisher & Norris, Trenton, N. J.—Bolt rail joints. B 6, and *annex*. 574
- 928 Wharton Railroad Switch Co., Philadelphia, Pa.—Railroad switch, steel rail frogs, steel rail crossing. D 71-73. 574
- 929 Weir, Fred. C., Cincinnati, Ohio.—Combined switch and frog, reversible frog. D 69. 574
- 930 Jersey City Iron Works, Jersey City, N. J.—Detachable steel rail frogs and crossings, safety switch stands, car replacer. D 71. 574
- 931 White, C. H., Detroit, Mich.—Railroad safety switch. D 66. 574
- 932 Pennsylvania Steel Co., Harrisburg, Pa.—Bessemer steel ingots, blooms, forgings, and rails, open hearth steel ingots and blooms, safety switch, steel rail crossing and frogs, car replacer. E 62. 574
- 933 Diamond Slate Iron Co., Wilmington, Del.—Railway track fastenings and merchant bar iron. E 62. 574
- 934 Pratt Manufacturing Co., New York, N. Y.—Elastic fish joints. E 62. 574
- 935 Bean, H., & B. F., Pawling, Pa.—Mail pouch holder and catcher for railroad cars while in motion, draw heads for cars. D 66. 575
- 936 Rousseau's Railway Signal Co., New York, N. Y.—Electric railway signals, office indicators, switch locks, circuit closer, etc. D 67. 575
- 937 Wharton, Wm., jr., Philadelphia, Pa.—D 72.
a Railway curves, street railway crossings, switches, and frogs. 574
b Railroad turn-table. 575
- 938 Spahn, Emil P., Newark, N. J.—Models for automatic railroad crossings, gates, and signals. D 67. 575
- 939 Ridge, Elmer, Philadelphia, Pa.—Balance folding gates for railway crossings. D 65. 575
- Machines used in preparing Agricultural Products.**
- 940 Deal, M., & Co., Bucyrus, Ohio.—Separator and smutter, brush smutter, warehouse separator, and mill machinery trucks, etc. E 57. 580
- 941 Bullock, C. K., Philadelphia, Pa.—Flour mill machinery. E 52. 580
- 942 Farr, Rigby, & Co., Springfield, Ohio.—Middlings purifier. E 57. 580
- 943 Empire Grain Decorticator Co., Pittsburg, Pa.—Grain decorticator, bran duster. E 57. 580
- 944 Howes, Babcock, & Co., Silver Creek, N. Y.—Smut and separating machines, oat separator, brush finisher, bolting cloth. E 49. 580
- 945 Noye, John T., & Son, Buffalo, N. Y.—Flour mill models, portable mills, millers' tools, middlings purifier, bran duster. E 47. 580
- 946 Ingraham & Beard, Chicago, Ill.—Grain scourer, smutter separator, grader, dustless malt and warehouse separator and grader. E 56. 580
- 947 Young, J., & S. Bernheisel, Green Park, Pa.—Flour bolt and middlings purifier combined, with bran separator and duster attached. E 57. 580
- 948 Harris, Clinton S., Elizabeth, N. J.—Smut and scouring machine, and suction fan for cleaning grain. E 58. 580
- 949 Richardson, D. M., Detroit, Mich.—Wheat scourer, polisher, and separator. E 57. 580
- 950 Turner, Parks, & Co., Cuyahoga Falls, N. Y.—Rolling screen separator, grain scourer. E 58, and *outside, near annex*. 580
- 951 Becker & Underwood, Dixon, Ill.—Brush for cleaning and polishing wheat. E 59. 580
- 952 Barnard & Leas Manufacturing Co., Moline, Ill.—Smutter, scourers, separator, flour packer, corn sheller, corn cleaner. E 48. 580
- 953 Chase Elevator Co., Peoria, Ill.—Models of grain elevator and conveyer. E 61. 580
- 954 Woodward, Thos. B., Philadelphia, Pa.—Mill stones, mills, flour mill machinery. E 46. 580
- 955 Baltimore Pearl Hominy Co., Baltimore, Md.—Hominy mill or corn granulator. F 59. 580
- 956 Straub, A. W., & Co., Philadelphia, Pa.—Vertical French burr mill stone, farm mill. E 59. 580
- 957 Griscom & Co., Pottsville, Pa.—Diamond mill stone dressing machine. E 53. 580
- 958 Harrison, Edward, New Haven, Conn.—Vertical burr stone mills for grain, minerals, etc. E 59. 580
- 959 Leonard & Silliman, Bridgeport, Conn.—Burr stone flour and grist mills. E 56. 580
- 960 Lafferty, H. W., & R., Gloucester, N. J.—Centrifugal sugar-draining machines, with mixer and elevator. E 46. 581
- 961 Mills, Thomas, & Bro., Philadelphia, Pa.—Candy-cutting, fruit-dropping, cocoanut-cutting and grating machines. E 65. 582
- 962 Gardner, Mrs. John, Philadelphia, Pa.—Confectionery tools, candy machinery. F 48. 582
- 963 Croft, Wilbur, & Co., Philadelphia, Pa.—Revolving pans for making confections. E 64. 582
- 964 Mitchell, J. H., Philadelphia, Pa.—Cocoanut grater, candy slicer. B 80. 582
- 965 Anderson, J. P., Philadelphia, Pa.—Cocoanut graters, candy slicers. F 45. 582

Agricultural Machines, Pneumatic, and Water Transportation.

- 966 Colburn, Levi J., Chicago, Ill.—Confectionery, process of manufacture. F 56. 582
- 967 Ordway, Albert, Richmond, Va.—Process of manufacturing plug and twist chewing and smoking tobacco, cigarettes. F 57. 584
- 968 Cain, P. O., & Co., Philadelphia, Pa.—Cigar moulds. F 55. 584
- 969 Enterprise Manufacturing Co., Philadelphia, Pa.—Coffee, drug, and spice mills, measuring faucets, tobacco cutters, cheese knives, sad irons, castings. F 56. 585
- 970 Dell, John C., Philadelphia, Pa.—Coffee mills. D 62. 585
- 971 Boyd, G., Philadelphia, Pa.—Coffee roaster, coffee cooler. (*Annex.*) 585
- 972 Kreider, Campbell, & Co., Philadelphia, Pa.—E 50. 580
a Grain mill. 585
b Spice mill.
- 973 Weikel & Smith Spice Co., Philadelphia, Pa.—Coffee roasting and spice mill machinery. (*Annex.*) 585
- 974 Troemner, Henry, Philadelphia, Pa.—Coffee mills. F 55. 585
- 975 McCollum, L. A., New York, N. Y.—Cracker machine, dough mixer, reversible dough brake, mechanical oven. E 66. 585
- 976 Silver & Deming Manufacturing Co., Salem, Ohio.—Meat choppers and meat stuffers. F 54. 586
- 977 Ruger, J. W., & Co., Buffalo, N. Y.—Cracker, bread, and cake machinery and bakers' tools. F 62. 586
- 978 Allen, H. Julian, Port Byron, N. Y.—Pneumatic evaporator. (*Pump annex.*) 586
- 979 Baker, George W., Wilmington, Del.—Machine for making crackers. F 60. 586
- 980 Sauter, Charles, Reading, Pa.—Malt cleaning machine, cylinder-wheel malt chopper. E 69. 587
- 981 Reford, J. W., Philadelphia, Pa.—Grain-distilling and vapor-rectifying apparatus. E 69. 587
- 982 Boese, C., & Co., New York, N. Y.—Capping machines, for adjusting metallic capsules on bottles, jars, etc. E 68. 587
- Aerial, Pneumatic, and Water Transportation.**
- 983 Hartness, James, Detroit, Mich.—Section balloon, with life-boat attached. D 32. 592
- 984 Swarzmayer, John, Philadelphia, Pa.—Flying machine model. D 33. 592
- 985 Page, E. W., New York, N. Y.—Boat oars. D 32. 594
- 986 Bolles, J. N., Baltimore, Md.—Models for submarine work. A 56, and outside. 594
- 987 Fields, William, Wilmington, Del.—Models of armor-ship, and field-battery gun. E 64. 594
- 988 Chomel, I. A., Brooklyn, N. Y.—Swinging berths and platforms for prevention of sea-sickness. D 31. 594
- 989 Grinnell, Irving, New Hamburg, N. Y.—Ice yacht. D 28-31. 594
- 990 Wilen, George C., Philadelphia, Pa.—Small boat. D 32. 594
- 991 Richards, H. J., West Troy, N. Y.—Ice yacht. D 34. 594
- 992 Walton, Lewis W., New York, N. Y.—Row-lock for boats. D 35. 594
- 993 Dammon, Samuel H., New Bedford, Mass.—Model of ocean yacht. D 34. 594
- 994 Desmond, Timothy, New York, N. Y.—Pair-oared gig. D 36. 594
- 995 Adams, John, & Co., Gloucester, N. J.—Life preserving mattress, self-righting life-boat. D 33. 594
- 996 Waters, E., & Sons, Troy, N. Y.—Paper boats, barrels, packages, cylinders, etc. D 34-37. 594
- 997 Bryant, John L., & Co., Philadelphia, Pa.—Double life boat. D 33. 594
- 998 Von Behren & Shaffer, Stryker, Ohio.—Boat oar, handspike. D 38. 594
- 999 Smith, D. S., Philadelphia, Pa.—Canoe, "Dolphin," of Queenstown, Md. D 38. 594
- 1000 Jones, John McA., Philadelphia, Pa.—Boat-detaching apparatus. D 32. 594
- 1001 Begin, Peter N., Detroit, Mich.—Revolving head light for vessels. D 34. 594
- 1002 Hook, Gilman, West Harwich, Mass.—Toy yacht. D 32. 594
- 1003 Rider Life Raft Co., New York, N. Y.—Life rafts. D 55. 594
- 1004 Miles, Geo. W., Philadelphia, Pa.—Single seull shell. D 40. 594
- 1005 McGilvery, S. W., Belfast, Maine.—Model for clipper ship. D 5. 594
- 1006 Merriman, Clark S., New York, N. Y.—Water proof life-saving dress. D 31. 594
- 1007 United States Bunting Co., Lowell, Mass.—Buntings and flags. F 40. 594
- 1008 Massachusetts Commission, Boston, Mass.—Models of ships, yachts, and other vessels, old and new styles. F 38-40. 594
- 1009 American Life-Saving Suit Co., New York, N. Y.—Life-saving suit for ocean travel, surf belt for river travel. D 33. 594
- 1010 Wyatt, John L., Yonkers, N. Y.—Full rigged clipper South Sea whale ship. E 38. 594
- 1011 Gildersleeve, S., & Sons, Gildersleeve's Landing, Conn.—Working models of steam and sail vessels. D 40. 594
- 1012 Poillon, C., & R., New York, N. Y.—Model of schooner yacht "Sappho," and pilot boats "Thomas S. Negus," of N. Y., and "E. C. Knight," of Philadelphia. E 39. 594
- 1013 Webb, Wm. W., New York, N. Y.—Models and plans of celebrated naval and other vessels. D 31. 594
- 1014 Cannon, John D., New Castle, Del.—Hooped skiff boat, without timbers or knees. D 40. 594
- 1015 Baird & Huston, Philadelphia, Pa.—Steam yacht. D 38-40. 595

Ships' Models and Appliances.

- 1016 Harlan & Hollingsworth Co.,
Wilmington, Del.—Ships, models, draw-
ings, and plans of vessels and machinery,
paintings of ships and steamboats. D
29. 595
- 1017 Griffiths, John W., New York, N.
Y.—Model of ocean steamship; "The
Progressive Ship Builder." B and E
74. 595
- 1018 Zantzinger, Dan'l W., Washing-
ton, D. C.—Model and section of steam-
ship, improvement in construction of iron
vessels. E 5. 595
- 1019 Grant, D. Conrad, Houghton,
Mich.—Adjustable ice plow and naval
ram, or submarine mortar, attached to
miniature boat. E 5. 595
- 1020 New York Safety Steam Power
Co., New York, N. Y.—Steam launch.
E 38-40. 595
- 1021 Crowell, J. W., & Co., Cambridge,
Md.—Models for steam and sail vessels.
D 5. 595
- 1022 Thwait, Charles, Astoria, N. Y.—
Model of steamship, with working machi-
nery. D 35. 595
- 1023 Pennsylvania Combined Iron and
Steel Association, Philadelphia, Pa.—
Combined iron and steel armor plate, steel
bore wrought iron guns. D 28-30. 595
- 1024 American Dredging Co., Phila-
delphia, Pa.—Grapple dredge, dipper
dredge. E 40. 596
- 1025 Cox, Frank, Philadelphia, Pa.—
Model for coffer dam for removing pro-
pellers from ships. E 40. 596
- 1026 Coffin & Woodward, Boston,
Mass.—Capstans, chain stopper, screw
steerer, and rudder supporter, elastic
traveler, portable winch, windlasses. D
39. 597
- 1027 Providence Steam Engine Co.,
Providence, R. I.—Original models. D
38. 597
- 1028 Getchett, John S., Washington,
Maine.—Capstan. D 40. 597
- 1029 American Ship Windlass Co.,
Providence, R. I.—Capstans, windlass
models. D 5. 597
- 1030 Hutchinson, T. C., Philadelphia,
Pa.—Anchor. D 5. 597

GREAT BRITAIN.

(South of North Avenue, Columns 6 to 17, A to E; also in Pump Annex.)

Metal, Wood, Stone, Cloth-Working Machines.

Machines, Tools, and Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 1 Holmes, Joseph E., Payton, Walter, and Taylor, Fenner, B., London.—Coal and rock-cutting machine; cylinder engine; rock-boring machines; revolving steam engine and air compressor. 500
- 2 Baird, William, & Co., Gartsherrie Iron Works, Coatbridge, Scotland.—Coal-cutting machine. 500
- 3 Hurd, Frederick, & Co., Wakefield.—Coal-cutting machine; ratchet wedge shovel; air compressor. 500
- 4 Macdermott, Martin, London.—Rock and coal perforators; machines for undercutting coal; screw wedge for breaking down coal. 500
- 5 Hardy Patent Pick Co. (Limited), Sheffield.—Implements for coal, ironstone, gold, and silver mining, for quarrying and excavating; cast steel picks. 502
- 6 Cooke, Joseph, & Co., Midland Davy Lamp Works, Birmingham.—Miners' safety lamps. 502
- 7 Bainbridge, Emerson, Duke of Norfolk's Collieries, Sheffield.—Miners' safety lamp. 502
- 8 Pickering, Jonathan, Globe Works, Stockton-on-Tees.—Pulley blocks; hoists; steam and water cylinder; steam pump. 503
- 9 The Dunston Engine Works Co., Gateshead-on-Tyne, Durham.—Stone breaker; combined stone breaker and bone cutter. 505
- 10 Kimberley, Nathan Gold, London.—Centrifugal pulverizing mills. 505
- 11 Siemens, Charles William, London.—Models of furnaces for metallurgical operations, glass melting, etc. 506
- 12 Smith, Dillwyn, Liverpool.—Mechanical stokers and fire bars. 506
- 13 Sugg, William, Vincent Works, London.—Gas burners; a new illuminating power meter. 509

Machines and Tools for working Metal, Wood, and Stone.

- 14 Roberts, William, Bootle, near Liverpool.—Self-acting painting machine for venetian blinds, laths, hoop iron, etc. 510
- 15 Massey, B., & S., Openshaw, Manchester.—Steam hammers; steam stamps; circular saw for cutting hot iron and steel; models of steam hammers; samples of forgings. 511

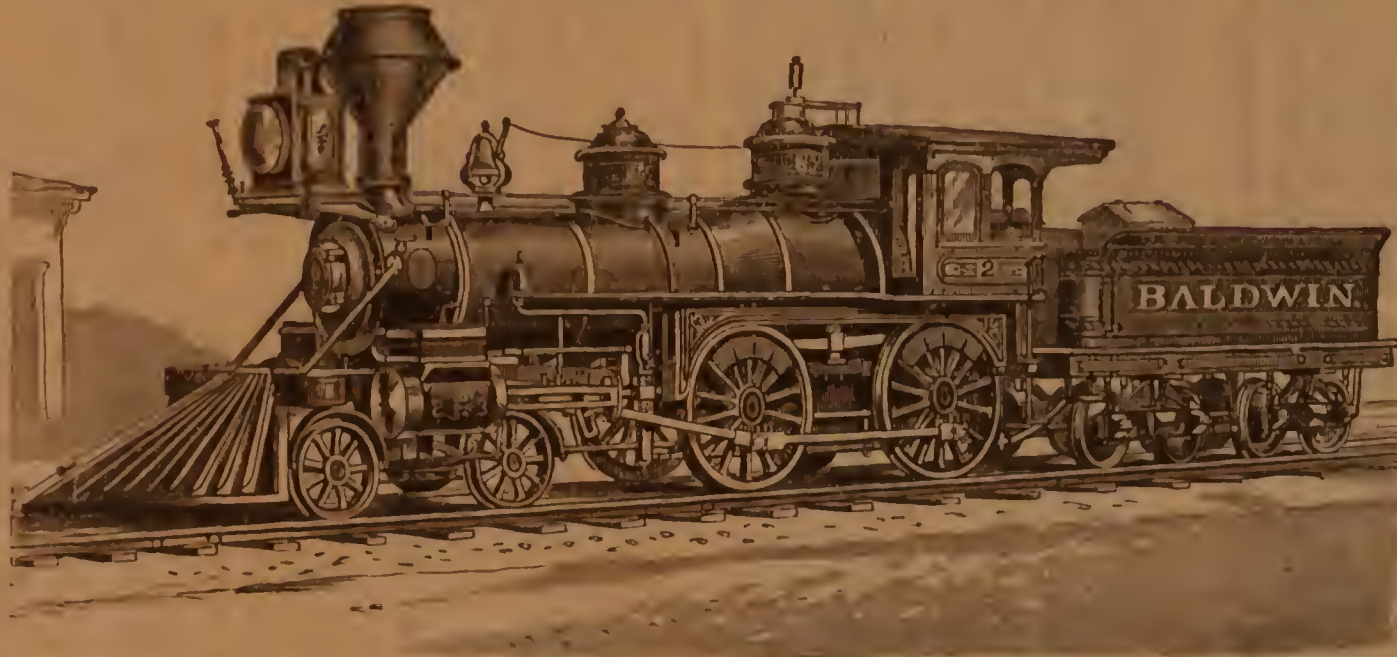
- 16 Wright, Peter, & Sons, Constitution Hill Works, Dudley, Worcestershire.—Anvils; vices; tools of various kinds; hammers. 514
- 17 Brooks & Cooper, Mousehole Forge, Sheffield.—Anvils, vises, hammers, shear steel, etc. 514
- 18 Beesley & Sons, Abbey Road Boiler Works, Barrow-in-Furness.—Punching, shearing, and angle-cropping machine for iron, steel, or other metals. 515
- 19 Heap, Joshua, & Co. (Limited), Oldham.—Tools and machines, taps, hobs, pipe; bolt-screwing and nut-tapping machines. 515
- 20 Nussey & Leachman, Leeds.—Hydraulic pressing machine; hydraulic punching, shearing, and riveting machine. 515
- 21 Shearer, Hugh, London.—Machine for dressing stone. 516
- 22 Lavers, Alfred Hamilton, London.—Testing machine to show strength of cement. 517

Machines and Implements of Spinning, Weaving, Felting, and Paper Making.

- 23 Fleming, Thomas, & Son, West Grove Mill, Halifax.—Card clothing for carding machines, etc.; needle-point teeth. 520
- 24 Ambler, William, Bradford, Yorkshire.—Machine for making paper cop tubes used in spinning; machine for cleaning the teeth of wheel castings. 520
- 25 Mackenzie, Duncan, London.—Self-acting reader for the Jacquard loom. 520
- 26 Ingham, John, & Sons, Croft Head Works, Thornton, near Bradford.—Case of shuttles, etc., for weaving; tacking, shuttle pikes, stocks, and bowls for weaving. 520
- 27 Platt Bros., & Co. (Limited), Hartford Works, Oldham, Lancashire.—Cotton gin. 521
- 28 Gadd, Thomas, Manchester.—Printing machine for large size garment rollers, angular engine; combined engraving and punching machine; setting-out table, with micrometer; combined varnishing and ruling machine; machine for setting out; ruling machine, clams, engravers' block, and lathe. 521
- 29 Lancaster, William, Willow Iron Works, Accrington, Lancashire.—Yarn-sizing dressing machine; self-stopping beaming machines; loom. 521
- 30 Booth, H., & Co., Preston, Lancashire.—Cotton-spinning machinery. 521

BALDWIN LOCOMOTIVE WORKS, BURNHAM, PARRY, WILLIAMS & CO., PHILADELPHIA.

ALL WORK
Accurately Fitted
TO GAUGES
AND
Thoroughly Interchangeable



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WORKMANSHIP,
FINISH AND EFFICIENCY
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ETC., ETC.

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FRANK THOMSON,
General Manager.

D. M. BOYD, Jr.,
General Passenger Agent.

Cloth and Paper-Working Machines, Motors and Appliances.

- 31 Carter, John, Halifax, Yorkshire.—Spinning frame. 551
- 32 Coats, J., & P., Ferguslie Thread Works, Paisley.—Spooling machine; thread-winding machine; machine for ticketing. 552
- 33 Gimson & Coltman, Leicester.—Rib top machine; circular machines. 551
- 34 Gimson & Coltman, Leicester.—Knitting machines. 552
- 35 Smith, John, & Samuel, Low Bridge Works, Keighley, Yorkshire.—Engineers' and machinists' tools and worsted machinery. 551
- 36 Lawson, Samuel, & Sons, Hope Foundry, Leeds.—Machinery for carding, preparing, and spinning jute, cop-winding machine. 554
- 37 Fairbairn, Kennedy, & Naylor, Leeds.—Machinery for preparing and spinning jute, hemp, flax, tow, and similar fibres. Carding engine; drawing, roving, and spinning frames. 554
- 38 Marshall, T. J., & Co., Campbell Works, Kingsland.—Dandy rolls and wire cloth, for paper making, and pulp strainer. 555

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 39 Smith & Starley, Trafalgar Works, Coventry.—Sewing machines; needles and attachments; stocking-darning machines; button-hole sewing machines; automatic work holders; electric motors, bicycles and suspended wheels. 551
- 40 Newton, Wilson, & Co., London.—Sewing machines, their appliances and apparatus. 551
- 41 Kimball & Morton, Anderston.—Sewing machines. 551
- 42 Greenwood & Batley, Albion Works, Leeds.—Belt-forging machines; machine for tying in warps for looms; printing machine. 551
- 43 Sanson, Robert Bell, London.—Spring arm endless band knife; cloth-cutting machine; parallel pressing machine for tailors' use. 551
- 44 Air Burning Co. (Limited), Glasgow.—Ironing table. 554
- 45 Broadbent, Thomas, Chapel Hill, Huddersfield.—Hydro extractor, for extracting water from wool, cotton, etc. 554

Machines and Apparatus for Type-Setting, Printing, Stamping, Embossing, and for Making Books, and Paper Working.

- 46 Beatty, Francis S., Dublin.—Lithographers' manifold transfer machines, for the reproduction of printed matter of enlarged or reduced dimensions from that of the original. 549
- 47 Lilly, John, & Co., London.—Perfecting and single cylinder printing presses. 549
- 48 Walter, John, London.—Printing press. 549
- 49 Shaw, William, London.—Logotypes and caps, shown in operation, printing press. 549

Motors and Apparatus for the Generation and Transmission of Power.

- 50 Green, Edward, & Son, Manchester.—Fuel economizer for heating the feed water for steam boilers. 550
- 51 Davey, Paxman, & Co., Colchester, Essex.—Portable steam engine; vertical boiler and engine; steam corn dryer; water heater. 550
- 52 Galloway, W., & J., & Sons, Knott Mill Iron Works, Manchester.—Steel boilers, for use in the British section. 550
- 53 Moy, Thomas, London.—Small steam engines for tramways, etc. 550
- 54 Ransomes, Sims, & Head, Orwell Works, Ipswich.—Portable steam engine, with apparatus for burning straw, reeds, sticks, etc. 550
- 55 Wright, William, Vulcan Foundry, Coatbridge.—Hot water boilers for heating dwellings, conservatories, etc. 550
- 56 Moncrieff, John, North British Glass Works, Perth, Scotland.—Steam boiler water gauge glasses. 551
- 57 Wier, Marshall Arthur, London.—Pneumatic motor, water meter, hydro-gyrometer, locomotive speed indicator, pneumatic gyrometer, reciprocating counter. 551
- 58 Thermo Electric Generator Co. (Limited), London.—Thermo batteries worked by gas, charcoal, or coke, in nature approaching the appearance of a gas stove. 552
- 59 Turner, Charles, Southampton.—Couplings for propeller shafts and other purposes. 553
- 60 Hewitt, William, Bristol.—Models of improved screw propellers; model of an improved principle for driving machinery; gun carriage; breech-loader gun. 553
- 61 Vansittart, Henrietta, Mrs., Twickenham.—Screw propeller. 554
- 62 Browne, John Collis, London.—Working model of steam hip and patent propeller. 554
- 63 Moncrieff, John, North British Glass Works, Perth.—Gauge glasses for indicating height of water in steam boilers. 555

Hydraulic and Pneumatic Apparatus, Pumping, Hoisting, and Lifting.

- 64 Gwynne, John, & Henry, Hammersmith Iron Works, London.—Models of compound surface-condensing engines. 560
- 65 Gwynne & Co., London.—Centrifugal pumps and engines, gas exhauster and engine. 560
- 66 Ellis, William Irlam, Manchester.—Blower or exhauster for air or gas. 562
- 67 Appleby Brothers, London.—Steam cranes. 563
- 68 Wallace & Tucker, Belfast.—Fire annihilator. Model of turret system of life preservation in case of shipwreck. 564
- 69 Haynes, Thomas, & Sons, London.—Platform pump; garden syringe; water bringer, for overcoming friction caused by drawing water through long lengths of hose; self-acting hose coiler. 564

Agricultural Machines, Railway Plant, Marine Appliances.

- 70 Needham & Kite, Phoenix Iron Works, London.—High pressure filter press. 565
- 71 Lawrence & Co., London.—Refrigerators; mashing machines, spargers, etc. 565
- 72 Dennis, T. H. P., & Co., Anchor Iron Works, Clemsford.—High pressure valves for steam, hot or cold water, or gas. 566

Railway Plant, Rolling Stock, and Apparatus.

- 73 Welch, Alfred, London.—Railway cattle wagons. 571
- 74 Williams, Richard Price, London.—Continuous railway crossings; switches for doing away with facing points on railways. 574
- 75 Brierley, Sons, & Reynolds, London.—Railway signal model of railway junction. 574
- 76 Seaton, William, London.—Saddle rail and permanent way construction. 574
- 77 Saxby & Farmer, London.—Railway signals; models of railway switches; junction, with switches and signals; railway level crossing gates. 574

Machines used in preparing Agricultural Products.

- 78 Sutcliffe, James S., Bacup, Lancashire.—Middlings flour separator. 580
- 79 Mirlees, Tait, & Watson, Glasgow.—Machinery in motion, consisting of sugar mills, valveless engine working an air pump for a vacuum pan, and driving centrifugal machines. 581
- 80 Collier, Luke, Rochdale.—Confectioners' machines. 582

- 81 Andrew, J. E. H., Stockport.—Machines for spinning tobacco; samples of twist tobacco from Europe. 584

Aerial, Pneumatic, and Water Transportation.

- 82 Siebe & Gorman, London.—Diving apparatus for two divers; figure of diver in diving suit, with the helmet and speaking apparatus. 594
- 83 Cruickshank, A. B., Dundee, Scotland.—Self-acting safety cleats for boats and yachts. 594
- 84 Logan, John Maxwell, Cambridge.—Model of four-oared racing boat, to take to pieces for convenience in traveling. 594
- 85 Inman Steamship Company (Limited), Liverpool.—Full rigged model and oil painting of the steamer "City of Berlin." 594
- 86 Hill & Clark, London.—Boat disengaging hooks. 594
- 87 Clark, Standfield, & Co., London.—Models of floating and gridiron depositing docks. 596
- 88 Roby, George, Wigan.—Hydro-pneumatic and other vessels for the storage of gunpowder, etc. 596
- 89 Bradford, William Henry, Great Saughall, near Chester.—Model of life boats; lateen rig; life or salvage boat; model of a ship's course indicator. 597
- 90 Wood, John William, Harwich, Essex.—Iron self-adjusting shot hole, rivet hole, and leak stopper. 597
- 91 Martin, Claude, London.—Self-canting anchors; chain cables; model of H. M.'s turret ram "Alexandra." 597
- 92 Gümpel, Charles Godfrey, London.—Ship's rudder. 597

CANADA.

(Central Aisle, Columns 1 to 7.)

Metallurgical, Chemical, Wood-Working Machines.

Machines, Tools, and Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 1 Hannahan, Joseph, Ottawa, Ont.—Rock-drilling bits. 590
- 2 Larue, H., Quebec, Q.—Magnetic separator. 505
- 3 Lymans, W. S., & Co., Halifax, N. S.—Gold quartz crushing machine. 505
- 4 Freeland, R., Toronto, Ont.—Soap-making machinery. 508
- 5 Ruthen, J., Ottawa, Ont.—Gas machine. 509
- 6 Cassegrain, H. Ed., Quebec, Q.—Gas machine. 509

Machines and Tools for Working Metal, Wood, and Stone.

- 7 McEachern, J. D., Harriston, Ont.—Barrel-making machine. 510
- 8 Gourley, C., & Co., Galt, Ont.—Sash and moulding machine, dove-tenoning machine, rotary bed planer. 510
- 9 Kennedy, W., & Son, Owen Sound, Ont.—Facing and jointing planer. 510
- 10 Tomlinson, Smith, & Co., Goderich, Ont.—Barrel-making machine. 510
- 11 Machine Co., Bowmanville, Ont.—Turning lathe for wood, moulding machine, planing and notching machine. 510

Wood, Metal, Cloth, Paper-Working Machines.

- 12 Westman, W. D., Toronto, Ont.—Foot circular saw and boring machine. 510
- 13 Abercrombie, W., Hamilton, Ont.—Relishing and mortising machine, sash clamp. 510
- 14 Waterous Eng. Works Co., Brantford, Ont.—Portable saw mill. 510
- 15 Mitchell & Taple, Harriston, Ont.—Wood-sawing machine. 510
- 16 Hamilton Tool Co., Hamilton, Ont.—Bend-sawing machine. 510
- 17 Gilbertson, W., Beaverton, Ont.—Sawing machine. 510
- 18 McKecknie & Bertram, Dundas, Ont.—Wood-moulding machine. 510
- 19 Smark, J., Brockville, Ont.—Bowling and mortising machine. 510
- 20 Harris, James, & Co., St. John, N. B.
a Shingle machine. 510
b Register grates. 513
- 21 Lordly, Howe, & Co., St. John, N. B.—Turning lathe. 510
- 22 Nelson, Thomas, & Co., Dundas, Ont.—Cast iron water pipe. 513
- 23 Campbell, George, Toronto, Ont.—Portable saw forges. 514
- 24 Tool and Machine Co., Dundas, Ont.—Arm-drilling machine, shaping and slotting machines. 515
- 25 Hinchliffe, R., Hamilton, Ont.—Screwing apparatus, test plates, screw-cutting lathes. 515
- 26 McKecknie & Bertrand, Dundas, Ont.—Iron turning lathes, radial drill, slotting and iron shaping machines. 515
- 27 Tool Co., Hamilton, Ont.—Engine lathe, bolt cutter, drilling machine, portable radial drill, steam hammer. 515
- 28 Machine Co., Bowmanville, Ont.—Metal turning lathe, planing machine. 515
- 29 Stephenson, M., Stratford, Ont.—Hand drilling machine. 515
- 30 Smark, J., Brockville, Ont.—Drilling machines. 515
- 31 Fisher, J., & Co., Kincardine, Ont.—Clipping boiler plate machine. 515
- 32 Mitchell, R., & Co., Montreal, Q.—Lead tube bending machine. 515
- 33 Dunn, P., Cote St. Paul, Q.—Wire nail machine. 515
- 34 McFarlane, Thum, & Co., Fredericton, N. B.—Vertical power drill. 515
- 35 Coore, E. R. N., & Co., St. John, N. B.—Nail machine. 515
- 36 Myers, S., & Son, St. John, N. B.—Small drill. 515
- 37 Bulmer & Sheppard, Montreal, Q.—Brick machine. 517

Machines and Implements of Spinning, Weaving, Felting, and Paper Making.

- 38 Powers, S. H., Woodstock, N. B.—Self-acting hand loom. 521
- 39 Becker, A., Montreal, Q.—Sample of card clothing. 522
- 40 Boeck, Chs., Toronto, Ont.—Combining machines for brush makers. 524

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 41 Piper, Thos., Hamilton, Ont.—Sewing machine. 531
- 42 Raymond, Guelph, Ont.—Sewing machines. 531
- 43 Gardner Sewing Machine Co., Hamilton, Ont.—Sewing machines. 531
- 44 Wilkie & Osborne, Guelph, Ont.—Sewing machines. 531
- 45 Wanzer & Co., Hamilton, Ont.—Sewing machines. 531
- 46 Canada Sewing Machine Co., Hamilton, Ont.—Sewing machines. 531
- 47 Aurthors, Jas., Toronto, Ont.—Sewing machines. 531
- 48 St. Amand, O., Quebec, Q.—Sewing machine. 531
- 49 Lawlor, J. D., Montreal, Q.—Sewing machines. 531
- 50 Morrill, O., & Co., Rock Island, Q.—Sewing machine. 531
- 51 Williams (C. W.) Manufacturing Co., Montreal, Q.—Sewing machines. 531
- 52 Harris, Th., Montreal, Q.—Sewing machine needle sharpener. 531
- 53 Wells & Gillespie, Toronto, Ont.—Reversible heel plates, boot and shoe stretcher. 532
- 54 Pettener, B. J., Montreal, Q.—Heel-burnishing machine, edge trimmer, heel trimmer, rolling machine, boot-crimping brake, boot seam rubber, boot tree, counter skiver, top punch, shoe fitting, and iron buffing machines. 533
- 55 Popham, E., Montreal, Q.—Steam peg breaker. 533
- 56 Clarke, R., St. John, N. B.—Lasts. 533

Machines and Apparatus for Type Setting, Printing, Stamping, Embossing, and for making Books, and Paper Working.

- 57 Fleming, John, Toronto, Ont.—Electrotyping machine. 541
- 58 Drummond, Geo. P., Ottawa, Ont.—Type-setting and distributing machine. 542
- 59 Dominion Type Foundry, Montreal, Q.—Types. 542
- 60 Burland, Desbarats, & Co., Montreal, Q.—Stereotyping, electrotyping. 542
- 61 Samson, Chs., Fredericton, N. B.—Printing stand. 543

Motors and Apparatus for the Generation and Transmission of Power.

- 62 Tandy, G. J., Kingston, Ont.—Steam boiler. 550
- 63 McKay, Adam, Dartmouth, N. S.—Model steam boiler. 550
- 64 Kennedy, Wm., & Sons, Owen Sound, Ont.—Water wheel. 551
- 65 Tuerk, F. W., Berlin, Ont.—Working model water wheel. 551

Motors, Hydraulic Apparatus, Railway Plant.

- 66 Barber & Harris, Meaford, Ont.—
Water wheel. 551
- 67 Goldie & McCulloch, Galt, Ont.
a Turbine water wheel. 551
b Steam engine. 552
- 68 McMartin, J. A., Montreal, Q.—Hy-
draulic motor. 551
- 69 Harris, J., & Co., St. John, N. B.—
Water wheel. 551
- 70 Fleck, A., Ottawa, Ont.—Oscillating
steam engine. 552
- 71 White, Yate, & Co., London, Ont.—
Steam engine. 552
- 72 Martin, Chs., Belleville, Ont.—Ver-
tical steam engine. 552
- 73 Beck, Geo. & W., Baden, Ont.—
Small steam engine. 552
- 74 Levy, Chas., & Co., Toronto, Ont.—
Steam engine. 552
- 75 Piper, Thos., Hamilton, Ont.—Model
four-cylinder engine. 552
- 76 Wilson, Th., & Co., Dundas, Ont.—
Steam engine. 552
- 77 Brush, Geo., Montreal, Q.—Steam
engine. 552
- 78 Gilbert, E. E., Montreal, Q.—High
speed steam engine. 552
- 79 Gardner, R., & Sons, Montreal, Q.
—Steam engine. 552
- 80 Gilbert, E. E., Montreal, Q.—Atmos-
pheric gas engine. 552
- 81 Bartley, W. P., Montreal, Q.—Steam
engine. 552
- 82 Tyzick, James, St. John, N. B.—
Motor. 552
- 83 Fleming, Geo., & Sons, St. John, N.
B.—Oscillating engine. 552
- 84 Gibson, F. J., Halifax, N. S.—Rotary
engine. 552
- 85 Smith, J. G., Dartmouth, N. S.—Min-
iature steam engine. 552
- 86 Dixon, Smith, & Co., Toronto, Ont.
—Belting. 553
- 87 Campbell, L. J., & Co., Montreal, Q.
—Belting. 553
- 88 Hardman, J. L., & Co., Montreal, Q.
—Belting. 553
- 89 Murphy, Lyman, & Co., St. John,
N. B.—Light and loose pulley. 553
- 90 Nelson, Thomas, & Co., Dundas,
Ont.—Screw propeller wheel. 554
- 91 McKeough, J. W., Chatham, Ont.—
Brass dome. 555
- 92 Morrison, James, Toronto, Ont.—
Steam, vacuum, hydraulic gauges. 555
- 93 Piper, Thos., Hamilton, Ont.—Steam
boiler detector gauge. 555
- 94 Myers, S., & Son, St. John, N. B.—
Governor. 555

Hydraulic and Pneumatic Apparatus,
Pumping, Hoisting, and Lifting.

- 95 Patrick, Rob., Galt, Ont.—Rotary
pump. 560
- 96 Cox, H. W., Peterborough, Ont.—
Rotary force pumps. 560
- 97 Oakville Manufacturing Co., Oak-
ville, Ont.—Force, well, and cistern
pumps. 560

- 98 Mills, C. P., Ste. Catherine, Ont.—
Iron pumps. 560
- 99 Clark, A. B., Ont.—Pump. 560
- 100 Bowes, E., & Son, Stratford, Ont.—
Force pumps. 560
- 101 Webster, Stephen, St. Catherines,
Ont.—Oil-storing tank. 560
- 102 Smark, J., Brockville, Ont.
a Cistern, well, and force pump. 560
b Jack screws. 563
- 103 Clark, C. W., Dundas, Ont.—
Well pump. 560
- 104 McMartin, J. A., Montreal, Q.—
Pump. 560
- 105 Burns, C. C., St. John, N. B.—
Rotary pump. 560
- 106 Jones, C. C., Fredericton, N. B.—
Barrel pump. 560
- 107 Wilson, Clarke, & Co., Yarmouth,
N. S.—Ship pump. 560
- 108 Myers, S., & Son, St. John, N. B.—
Blower. 562
- 109 Fenson, S., Toronto, Ont.—Hy-
draulic elevator. 563
- 110 McMartin, J. A., Montreal, Q.—
Hydraulic meter. 563
- 111 Small & Fisher, Woodstock, N. B.
—Barrel lifter. 563
- 112 Dailey, M. E., Ottawa, Ont.—Tele-
scope trestle. 563
- 113 Ronald, John D., Chatham, Ont.—
Steam fire engine, hose cart and
hose. 564
- 114 Fire Extinguisher Manufacturing
Co., Toronto, Ont.—Stationary en-
gine. 564
- 115 Chatterton, R. D., Cobourg, Ont.—
Ladder fire escape. 564
- 116 Prowse Bros., Montreal, Q.—Fire
extinguisher. 564
- 117 Murphy & Harle, Montreal, Q.—
Pneumatic fire extinguisher. 564
- 118 Bustin, Robert, St. John, N. B.—
Fire escape. 564
- 119 Smith, H. F., Toronto, Ont.—Soda
water fountain. 565
- 120 Sells, H., Vienna, Ont.—Cider mill
and press. 565
- 121 Brazil, P., Barrie, Ont.—Cider mill
and press. 565
- 122 Date, John, Montreal, Q.—Diving
apparatus. 567
- 123 Pitts, D. H., Halifax, N. S.—Sub-
marine armor. 567

Railway Plant, Rolling Stock, and
Apparatus.

- 124 Meyer, F. W. A., Montreal, Q.—
Drawing of engine and tender. 570
- 125 Chatterton, R. D., Cobourg, Ont.
a Railway collision springs. 571
b Self-acting coupler. 572
- 126 Jones & Burland, Montreal, Q.—
Railway springs. 571
- 127 Knolt, Kennard, Petersville, L.,
Ont.—Cattle car and refrigerating ten-
der. 571
- 128 Peters, H. J., Quebec, Q.—Dumping
car. 571

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SCHENCK'S MANDRAKE PILLS,
FOR ALL BILIOUS DISORDERS.

Railway Plant, Agricultural Machines, Marine Models.

- 129 Wright, W., Oakville, Ont.—Car coupler. 572
- 130 Cornell, S., Widden, Ont.
 a Car coupling. 572
 b Rail joint protector. 574
- 131 Gardner, R., & Son, Montreal, Q.—Brake machine. 572
- 132 Chisholm, R. N., Oakville, Ont.—Car coupling. 572
- 133 Richard, E. O., & Brother, St. Roch, Q.—Car brakes and coupling. 572
- 134 Car Wheel Co., Toronto, Ont.—Car wheels and axles. 573
- 135 McDougall, J., & Co., Montreal, Q.—Car wheels and axles. 573
- 136 Harris, J., & Co., St. John, N. B.—Railroad car wheels and axles. 573
- 137 Von Staden, W. G., Strathroy, Ont.—Bent posts and rafters for railroad cars. 574
- 138 Taylor, R., Guelph, Ont.—Rail joint and nut lock. 574
- 139 Dunn, Wm., St. Mary's, Ont.—Safety switch. 574
- 140 Nunn, W. C., Belleville, Ont.—Railway telegraph signals, with revolving and fixed lamps, and electric gong. 575
- 141 Morris, J. W., Hamilton, Ont.—Movable railroad guide signals. 575
- 142 Brydon, R., Newbury, Ont.—Grain car. 576
- 143 Dunn, Wm., St. Mary's, Ont.—Safety car coupler. 576
- 144 Ramsay, R. U., Cobourg, Ont.—Self-acting truck reliever for cars. 576
- 145 Edgecomb, F. B., Fredericton, N. B.—Flanges. 576
- 146 Kennedy, E., St. John, N. B.—Locomotive ash pan cleaner. 576
- 147 Hewkesurrt, D., Digby, N. S.—Spark arresters. 576

Machines used in Preparing Agricultural Products.

- 148 Plate, Samuel, Goderich, Ont.—Cylindrical mill stones. 580
- 149 Copping, G. W., Toronto, Ont.—Lozenge machine. 582
- 150 Gardner, R., & Sons, Montreal, Q.—Cracker machine, mixing machine. 582
- 151 Scalas, Rob., Toronto, Ont.—Evaporator and tobacco lump machine. 584
- 152 Adams, J. L., Montreal, Q.—Tobacco cutter. 584
- 153 Marengo, J. & A., Montreal, Q.—Cigarette machine. 584
- 154 McKay, John, Dundas, Ont.—Pot and pearl barley machine. 584

Aerial, Pneumatic, and Water Transportation.

- 155 Herald, D., Gore's Landing, Ont.—Canoes. 594
- 156 English, W., Peterborough, Ont.—Hunting canoe. 594
- 157 Lemons, John, Hamilton, Ont.—Model life boat. 594
- 158 Marsh, P. C., Hamilton, Ont.—Fore and aft sail reefer. 594

- 159 Power, W., & Co., Kingston, Ont.—Ship models. 594
- 160 Lapierre, Zephirin, Isle of Orleans, Q.—Sailing boat rigged, rowing boat, winter canoe. 594
- 161 Charland, J. B., Levis, Q.—Ship model. 594
- 162 Valin, P. V., Quebec, Q.—Ship model. 594
- 163 Baldwin, P., St. Roch, Quebec, Q.—Ship model. 594
- 164 Dunn & Samson, Levis, Q.—Ship models. 594
- 165 Rose, N., Levis, Q.—Ship models. 594
- 166 Dinning, H., Quebec, Q.—Ship models. 594
- 167 Marquis, F. H., Levis, Q.—Ship models. 594
- 168 Auger, E., Quebec, Q.—Ship models. 594
- 169 Cotman, W., Quebec, Q.—Ship models. 594
- 170 Samson & Co., Quebec, Q.—Ship models. 594
- 171 Gingras, E., Quebec, Q.—Ship models. 594
- 172 Oliver, J., Quebec, Q.—Ship models. 594
- 173 Oliver, F. H., Quebec, Q.—Ship models. 594
- 174 Quebec Advisory Board, Quebec, Q.—Ship models. 594
- 175 Sewell, E. W., Levis, Q.—Winter canoe, drawings of safety ship, ship and yacht models. 594
- 176 Robitaille, Th., Quebec, Q.—Complete cod-fishing boat; "Micmac" bark canoe. 594
- 177 Charland, W., Levis, Q.—Ship model. 594
- 178 Grenier, Frs., Isle of Orleans, Q.—Pilot boat. 594
- 179 Girard, A., Murray Bay, Q.—Poplar canoe. 594
- 180 Hibblee, A. T., St. John, N. B.—Model dingle for pilot use. 594
- 181 Woodley, John, St. John, N. B.—Quarter boat. 594
- 182 Ross, Elizah, Portland, N. B.—Single scull racing boat, spoon-set oars, set single scull oars, set oars, life boat model. 594
- 183 Barrill, Jos., Yarmouth, N. S.—Ship model, improved gear for reefing sail. 594
- 184 Moreley, E., Darmouth, N. S.—Ship models. 594
- 185 Garmount, Wm.—Ship model. 594
- 186 Dailey, M. E., Ottawa, Ont.—Model ocean ship. 595
- 187 Merritt, Abel, Chatham, Ont.—Propeller boat. 595
- 188 Richelieu & Ontario Navigation Co., Montreal, Q.—Steamboat models. 595
- 189 Wildgoose, F. H., Montreal, Q.—Steamboat model. 595

Marine Models and Appliances.

- | | |
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| <p>190 Meyer, F. W. A., Montreal, Q.—Drawing longitudinal section steam-boat. 595</p> <p>191 Sewell, E. W., Levis, Q.—Drawing of steamship for Canadian trade. 595</p> <p>192 Beutey, H., Quebec, Q.—Dragging or grappling apparatus. 596</p> <p>193 Carroll, S., Widden, Ont.—Marine compass, automatic ship trimmer. 597</p> | <p>194 Pitts, D. H., Halifax, Ont.—Ship windlass and cable brake. 597</p> <p>195 Mosler, Geo. J., Maitland Island, N. B.—Ship wheel. 597</p> <p>196 Harris, James, & Co., St. John, N. B.—Capstan. 597</p> <p>197 Pitts, D. H., Halifax, N. S.—Mast hoop clamp, cable brake, metal jib hank. 597</p> <p>198 Couvrette & Frigon, Montreal, Q.—Stern of ship (model). 597</p> |
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FRANCE.

(North of Central Aisle, Columns 1 to 7.)

Metal, Wood, Stone, Textile Machines.

Machines, Tools, and Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 1 Fleury, Jules Martin, Paris.—Grinding mill. 505
- 2 David Bros., Charleville (Ardenne).—Portable forges. 506
- 3 Perret, Michel, Paris.—Apparatus for combustion. 506
- 4 Goyard, F., Paris.—Crucibles and furnaces. 506
- 5 Enfer, A., jr., Paris.—Portable forges and bellows. 506
- 6 Enfer, Ernest, Paris.—Portable forges; forges for the laboratory; gas pressure bellows apparatus; bellows. 506
- 7 Chenaillier, Paris.—Universal evaporator. 506
- 8 Faure & Kessler, Clermont-Ferrand.—Apparatus for the concentration of sulphuric acid. 508
- 9 Desmoutis, Quennessen, & Le Brun, Paris.—Platina apparatus. 508
- 10 Pelouze, E., & Audouin P., Paris.—Condenser for gas works. 509
- 11 Lascole, A., Paris.—Gas apparatus. 509

Machines and Tools for Working Metal, Wood, and Stone.

- 12 Arbey, F., Paris.—Wood-Working machinery. 510
- 13 Branche, H., Paris.—Machines and tools. 510
- 14 Rous, Edmond, Paris.—Tools of precision. 510
- 15 Dugoujon, Senior, Paris.—Saws. 510
- 16 Deplanque, Son, Senior, Maison-Alfont (Seine).—Emery millstones. 515
- 17 Limet-Lapareille & Co., Paris.—Files. 515

- 18 La Quintinie, A., & Co., Paris.—Machines and tools for goldsmiths; designs of machines for soap, confectionery, and matches. 515
- 19 Durrschmidt, Lyons.—Emery millstones. 515
- 20 Durand, F., & Marais, Paris.—Brick machines. 517

Machines and Implements of Spinning, Weaving, Felting, and Paper Making.

- 21 Guinet, Ant., & Co., Lyons.—Silk-weaving looms. 520
- 22 Richard, J. S., Paris.—Machines and looms for textiles. 521
- 23 Pierron & Dehaitre, Paris.—Weaving machine. 522
- 24 Couture, Paris.—Breaking Machine for textile fabrics. 523
- 25 Maigrou, F. A., Paris.—Rope machine. 524
- 26 Deny, Louis, Paris.—Open copper cylinder and refiner for paper manufacture. 525
- 27 Thomine, F., Paris.—Machine for the manufacture of fishing nets. 527

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 28 Legat, D., Paris.—Machine for sewing straw hats. 531
- 29 Cornely, E., Paris.—Embroidering machines. 531

Machines and Apparatus for Type Setting, Printing, Stamping, Embossing, and for Making Books, and Paper Working.

- 30 Coblenz, Paris.—Electrotypes. 541

Paper-Working Machines, Motors, Hydraulics, Railway Plant.

31 Derriey, Ch., Paris.—Typography, engraving, and electrotypes. 541

32 Lecerf, L., Paris.—Printing materials. 543

33 Tucker, Paris.—Types and cuts. 543

34 Vital, A., Paris.—Rollers for lithographic presses. 543

Motors, and Apparatus for the Generation and Transmission of Power.

35 Leroy, Francois, Marseilles.—Models of marine boilers. 543

36 Fontaine, Hippolyte, Paris.—Steam engines. 552

37 Electro-Magnetic Machine Manufacturing Co., Paris.—Gas machines, galvano-plastic machine, machine to transmit power. 552

38 Mignon & Rouart, Paris.—Noiseless gas motors. 552

39 Chauveau, Paris.—Steam engines. 552

40 Breguet, Paris.—Electro-Magnetic machines. 552

41 Rous, Edmond, Paris.—Hermetic clasps for oil cups, etc. 553

42 Welby, Rouen.—Belting. 553

43 Jacob, Ch. Moise, Paris.—Oiling cushions. 553

44 Domange, Lemierre, & Co., Paris.—Belting. 553

45 Perreaux, L. G., Paris.—Screw propeller. 554

46 Dechamp, C., Lyons.—Safety boiler apparatus. 555

47 Cazaubon, Dominique, Paris.—Cocks for steam, water, and gas pumps, and water closets. 555

48 Lion & Guichard, Paris.—Metallic manometer. 555

49 Macabies, Paris.—Automatic feeder. 555

50 Rigollot, Paris.—Cocks for water, steam, and gas. 555

51 Cuau, Paris.—Boiler injector. 555

52 Coux des Roseaux, Asnieres, near Paris.—Automatic oil cups for steam machines; fire-proof insulator for steam pipes. 555

Hydraulic and Pneumatic Apparatus, Pumping, Hoisting, and Lifting.

53 Neut, L., & Dumont, L., Paris.—Centrifugal pumps. 560

54 Garlaudat, Paris.—Refrigerating apparatus. 562

55 Enfer, A., jr., Paris.—Portable forges and bellows. 562

56 David Bros., Charleville (Ardennes).—Portable forges. 562

57 Enfer, Ernest, Paris.—Portable forges, bellows, gas apparatus. 562

58 Morane, jr., Paris.—Hydraulic press for candle manufacture. 563

59 Chrétien, J., Paris.—Automatic apparatus for unloading coal. 563

60 Rous, Edmond, Paris.—Pulleys and tackles. 563

61 Mégy, Echeverria, & Bazan, Paris.—Elevators, regulators, etc. 563

62 Gaussart, Epernay (Marne).—Machines for charging wines with gas. 564

63 Constant, Port-a-Binson (Marne).—Wine press. 565

64 Appert-Mandart, Reims (Marne).—Hooks and clasps for champagne. 565

65 Lejeune, Epernay (Marne).—Machine for charging wines with gas. 565

66 Renard, Epernay (Marne).—Wires and strings for champagne. 565

67 Paillet & Co., Epernay (Marne).—Corks. 565

68 Cazaubon, D., Paris.—Soda water machines; siphons. 565

69 Freal, Epernay (Marne).—Bottling machines. 565

70 Gervais, E., Bordeaux.—Bottling machines. 565

71 Guéret Bros., Paris.—Soda water machine. 565

72 Logette, Ay (Marne).—Clasps for bottles and machines for applying. 565

73 Maldine, H., Paris.—Soda water machines, siphons. 565

74 Maurice, Widow, & Guenin, Epernay (Marne).—Bottling machines. 565

75 Michelot, jr., Epernay (Marne).—Stands and cases for wines. 565

76 Thessier, Fevre, Paris.—Table apparatus for Seitzer water. 565

77 Tricourt, A., Reims (Marne).—Wine-making machines. 565

78 Mestre, A. de, Bordeaux.—Bottling machines. 565

79 Mondollot, A., Paris.—Soda water machine, siphons. 565

80 Cicile-Larbre, Reims (Marne).—Bottle cleaners. 565

81 Durafort, Paris.—Soda water machine. 565

82 Fisse-Thirion, & Co., Reims.—Bottling machine. 565

83 Rigollot, Paris.—Cocks for water, steam, and gas. 566

84 Perreaux, L. G., Paris.—Rubber valves. 566

85 Giffard & Berger, Paris.—Ice machines. 566

86 Carré, E., Paris.—Ice machine. 566

Railway Plant, Rolling Stock, and Apparatus.

87 Edoux, Leon, Paris.—Special system for mountain railroads. 570

88 Joliot, S., Vincennes.—Car brakes. 572

89 Le Bas, Paris.—Automatic clutch. 572

90 Arbel Lucien, Rive-de-Gier (Loire).—Forged iron wheels for locomotives and cars. 573

91 Brunon Bros., Rive-de-Gier (Loire).—Wheels manufactured by hydraulic pressure. 573

Machines used in Preparing Agricultural Products.

92 Aubin & Baron, Paris.—Bolting mill. 580

Machines for Agricultural Products, Ship's Model.

- 93 Durrschmidt, Lyons.—Emery mill-stones. 580
- 94 Beyer Bros., Paris.—Soap and chocolate machines. 582
- 95 Hermann, G., Paris.—Chocolate machines. 582
- 96 Durvie, Ivry-la-Bataille (Eure).—Mechanic kneading machine. 582

- 97 Beyer Bros., Paris.—Soap and chocolate machines. 585

Aerial, Pneumatic, and Water Transportation.

- 98 General Transatlantic Company, Paris.—Model of the steamship "Pe-reire." 595

GERMANY.

South of Central Aisle, Columns 1 to 7, and Pump Annex.)

Metal, Wood, Cloth-Working Machines, Motors.

Machines, Tools, etc., of Mining, Chemistry, etc.

- 1 Sparre, Julius von, Dortmund.—Model of a drill. 500
- 2 Wünschmann, Reinh., Leipsic.—Candle-making machine. 508

Machines and Tools for Working Metal, Wood, and Stone.

- 3 Kahlke & Detlassen, Hamburg.—Machinery. 510
- 4 Schlickeysen, C., Berlin.—Machinery of various kinds. 517
- 5 Loeff, Paul, Berlin.—Model of a stove. 517

Machines and Implements of Spinning, Weaving, etc.

- 6 Windmüller & Meynen, Zwischenahn (Gr. Duchy of Oldenburg).—Wooden spools. 520
- 7 Schimmel, Oscar, & Co., Chemnitz.—Spinning machine. 521
- 8 Grothe, H., Berlin.—Model of a machine for removing the threads from the contine carders. 521
- 9 Mittweida Carder Factory, Mittweida, Saxony.—Carders. 522
- 10 Beuthner, Gebr, Berlin.—Carders. 522

Machines, etc., used in Sewing, Making Clothing, etc.

- 11 Bellé, R., Aix-la-Chapelle.—Needles. 530
- 12 Huhn, Heinr., & Co., Aix-la-Chapelle.—Needles. 530
- 13 Lammertz, Leo., Aix-la-Chapelle.—Needles. 530
- 14 Neuss, H. F., Aix-la-Chapelle.—Needles. 530
- 15 Pastor, Ph. H., Sons, Burtscheid, near Aix-la-Chapelle.—Needles. 530
- 16 Zimmermann, Jos., Aix-la-Chapelle.—Needles. 530

- 17 German Sewing Machine Factory, formerly Jos. Wertheim, Frankfort-on-Main.—Sewing machines. 531

COLLECTIVE EXHIBIT BY THE MANUFACTURERS OF SEWING MACHINES. 531

- 18 Müller, Cl., Dresden.
- 19 Kiehle, R., Leipsic.
- 20 Hamburg-American Sewing Machine Factory Joint Stock Company.—Sewing machines, etc. 531
- 21 Schmalz, F. G., Altenburg.—Machines for making gloves. 532
- 22 Hemmer, L. Ph., Aix-la-Chapelle.—Fulling and washing machine. 534
- 23 Dausch, J. G., Munich.—Watch-makers' tools. 535
- 24 Dubois, H. Aug., Duren.—Model of a polishing machine. 537

Machines for Printing, Making Books, Paper Working, etc.

- 25 Schmiers, Werner, & Stein, Leipsic.—Fast presses. 540
- 26 Traiser, Carl, Darmstadt.—Ruling machine. 541
- 27 Lotz, Ferd., Offenbach-on-Main.—Lithographic machinery. 543

Motors, Power Generators, etc.

- 28 Blancke, Em. A. R., Frankfort-on-Oder.—India rubber and armatures. 550
- 29 Schilling, F. A., Bremerhaven.—Steam engines. 552
- 30 Gas Motor Factory, Deutz.—Gas motors. 552
- 31 Blancke, C.W. J., & Co., Merseburg.—Manometer. 555
- 32 Bodemer, Georg, Zschopau, near Chemnitz.—Regulators. 555
- 33 Schäffer & Budenberg, Buckau, near Magdeburg.—Manometer. 555
- 34 Osenbrück & Co., Hemelingen, near Bremen.—Rotary lubricators. 555

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OFFICE AT THE CENTENNIAL GROUNDS,

Just north of Machinery Hall, where all Advertisers are invited
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Hydraulic, Pneumatic Apparatus, Railway Plant.

35 Gehrckens, C. Otto, Hamburg.—
Stufing boxes. 555

36 Wertheim, Louis, Bornheim, near
Frankfort-on-Main.—Steam packing. 555

Hydraulic and Pneumatic Apparatus.

37 Alléoud, Emanuel, Metz.—Siphon
pumps. 563

38 Weyhe, Wilh., Bremen.—Rotary
pumps. 563

39 Royal Saxon Fire Extinguisher Co.,
Leipzig.—Fire extinguishing appara-
tus. 564

40 Schultz, Ernst, Aschaffenburg.—At-
mospheric apparatus. 564

41 Gassen, J. B., Coblenz.—Gauge. 566

Railway Plant, Rolling Stock, etc.

42 Glöckner Bros., Tschirndorf, near
Halbau.—Blocks for brakes. 572

43 Camozzi & Schlösser, Frankfort-on-
the-Main.—Railway switch. 574

Aerial, Pneumatic, and Water Trans-
portation.

44 Dücker, Baron F. F. von, Bückeburg.
—Drawing of a wire-rope railway. 590

45 Cordes, H. G., Bremerhaven.—Gun
for saving shipwrecked persons. 594

46 Hamburg-American Joint Stock
Steamship Co., Hamburg.—Model of a
mail steamship. 595

AUSTRIA.

(South of South Aisle, Columns 1 to 5.)

Machines and Motors.

Machines, Tools, etc., of Mining,
Chemistry, etc.

1 Rosenegger, Joseph, Oberalm, near
Hallein, Salzburg.—Model of a glass-
melting furnace, cylinder furnace. 500

2 Noback Bros. & Fritz, Prague.—
Models and apparatus for arrangement of
breweries and malt-houses. 508

Machines and Implements of Spin-
ning, Weaving, etc.

3 Schram, Willibald, Vienna.—Jac-
quard machines. 541

4 Surber, I. Jacques, Vienna.—Weav-
ers' reeds. 547

Motors, Power Generators, etc.

5 Hock & Co., Julius, Vienna.—Pe-
troleum and steam engines and boilers. 550

6 Popper, Joseph and David, Vienna.
—Patent boiler incrustation preserver,
boiler fittings. 565

Railway Plant, Rolling Stock, etc.

7 Tagleicht, Karl, Vienna.—Locomo-
tive spark guard. 575

Machinery used in Preparing Agri-
cultural Products.

8 Vojtěchovsky & Reznicek, Prague.
—Machines for candy production. 582

SWITZERLAND.

(Pump Annex.)

Motors, Railway Appliances.

Motors, Power Generators, etc.

1 Sulzer Brothers, Winterthur, Ct.
Zurich.—Model of a new system of re-
versing gear for valve engines. 555

Railway Plant, Rolling Stock, etc.

2 Swiss Manufacturing Co., Neuhaus-
sen, near Schaffhausen.—Model of an
apparatus for heating railway car-
riages. 571

*Machines pertaining to Watchmaking are exhibited in Swiss Section, Main Building, and
catalogued in Volume I.*

BELGIUM.

(South of North Aisle, Columns 6 to 17.)

Metal, Wood, Cloth-Working Machines, Motors.

Machines, Tools, and Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 1 Dubois, Wm. & Francis Joseph, Seraing, near Liège.—Drilling machine for mines, tunnels, etc. 500
- 2 Chaudron, Joseph, Brussels.—Models and plans of shafts sunk in Belgium. 501
- 3 Libotte, Nicholas, Gilly, near Charleroi.—Cages with system of parachute, wagons with overthrowers. 502
- 4 Muller & Co., Clermont, near Liège.—Safety wicks for miners. 502
- 5 Sonheur, Arnold, Seraing, near Liège.—Safety lamps for fire-damp mines. 502
- 6 Van Flaecht, Emile, Haeren, near Brussels.—Models of fat-rendering works, with samples of stearine and oleine. 508

Machines and Tools for Working Metal, Wood, and Stone.

- 7 De Tombay, Auguste, Marcinelle, near Charleroi.
 - a Model of a trip-hammer. 514
 - b Model of steam shears. 515
- 8 Jullien & Jennar, Bomereë, near Charleroi.—Vise, blast-pipe, axle. 514
- 9 Nicaise, Ch., & Co., and Gobert, Aug., La Louvière.—Machinery for making bolts. 516

Machines and Implements of Spinning, Weaving, and Paper Making.

- 10 Bède & Co., Verviers.—Wool cleaning machine. 522
- 11 Delrez, Felix, Verviers.—Cards. 522
- 12 Dethiou, Gilles, & Co., Verviers.—Cards. 522
- 13 Horstmans Brothers, Liège.—Cards.
- 14 Martin, Célestin, Verviers.—Looms, mechanical winder, cards. 522
- 15 Martin, Th. J., Pisseroule-Dison, near Verviers.—Cards. 522

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 16 Turner, B. B., & Co., Brussels.—
 - a Festooning and embroidering machines. 530
 - b Sewing machines for gloves, straw hats, button-holes, etc. 531
- 17 Joint Stock Society for the Manufacture of Machines and Tools of Precision, Saint Josse-ten-Noode.—Screwing, sewing, and knitting machines. 531

Machines and Apparatus for Type-setting, Printing, Stamping, Embossing, and for Making Books, and Paper-working.

- 18 Derkx-Schlopfer, I. F., Anderlecht, near Brussels.—Wooden printing types 542

Motors, Power Generators, etc.

- 19 Van den Kerchove, P., Ghent.—Corliss engines and Rider machine. 552
- 20 Dolne, L., & Co., Verviers.—Belt-
ing. 553
- 21 Horstmans Bros., Liège.—Belt-
ing. 553
- 22 Versé-Spelmans, Brichot, Ant., & Co., Brussels.—Belting. 553
- 23 Dervaux, Alfred, Brussels.—Feeding apparatus for boilers. 555

Hydraulic and Pneumatic Apparatus.

- 24 Moreau, Léon, Brussels.—Fire-engine, pumps. 560

Railway Plant, Rolling Stock, etc.

- 25 Durieux & Co., Louvain.—Wheels for cars, carriages, etc. 573
- 26 Mabile, Valère, Mariemont.—Railway stock. 573
- 27 Legrand, Achille, Hyon, near Mons.—Sleepers and cushions for mining railway. 573
- 28 Léonard, F. L. J., Fayt, near Seneffe.—Railway brake, signals and gates, and ovens. 575

NETHERLANDS.

Machines and Motors.

Machines and Tools for Working Metal, Wood, and Stone.

- 1 Haverkamp, Begemann, Helmond.—Gutter bore machines. 515

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 2 Rennes, D. W. van, Utrecht.—Sewing machine. 531

Motors, Power Generators, etc.

- 3 Prakke, J. E. & H., Eibergen.—Leather straps; belting. 553
4 Haeff, G. & M., Lochem.—Leather straps; belting. 553

Hydraulic and Pneumatic Apparatus.

- 5 Rennes, D. W. van, Utrecht.—Machine for moving liquids by heat. 563
6 Rietschoten, van, & Houwens, Rotterdam.—Model of engine for deepening rivers, etc. 563
7 Bickers & Zoon, Rotterdam.—Fire extinguishers. 564
8 Burger, H., Deventer.—Velocipedes. 571
9 Heshuijsen, W. F., Sandpoort.—Railroad switch. 572
10 Bens, A., Deventer.—Coffee and bean mills. 585

SWEDEN.

(North of North Aisle, Columns 6 to 15.)

Mineral, Metal, Cloth, and Paper-Working Machines.

Machines, Tools, and Apparatus of Mining, Metallurgy, Chemistry, and the Extractive Arts.

- 1 Nilson, G., Eskilstuna.—Jacks. 503
2 Alsing, J. R., Stockholm.—Model of cylinder for crushing hard materials. 505
3 Robertson, D., Goteborg.—Machine for making peat bricks. 505
4 Roos, J. J., Norrköping.—Machine for making peat bricks. 505
5 Samuelson, S. H., Foskefors, Rada.—Machine for making hollow peat bricks. 505
6 Soderqvist, R., Goteborg.—Gas apparatus. 509

Machines and Tools for Working Metal, Wood, and Stone.

- 7 Boethius, Emil, Stockholm.—Cork-cutting machines. 510
8 Bolinders, J. & C. G., Machine Manufacturing Stock Co., Stockholm.—Sawing machines. 510
9 Von Essen, H. H., Baron, Tidaholm.—Iron for turning veneer. 510
10 Stridsberg & Bjork, Thorsträlla.—Saws, planing irons, etc. 510

- 11 Fagersta Manufacturing Co., Westaurs.—Saws. 510
12 Sandvikens Iron Works, Sandviken.—Piston rod for steam hammer. 514
13 Bolinders, J. & C. G., Stockholm.—Machines for making metal cartridges; emery wheels. 515
14 Brehmer, E. F. A., Stockholm.—Drilling machine. 515
15 Kopings Machine Manufacturing Stock Co., Köping.—Turning machine. 515

Machines, Apparatus, and Implements used in Sewing and Making Clothing and Ornamental Objects.

- 16 Hedlund, Joh., Eskilstuna.—Sewing machines. 531
17 Husqvarna Arms Manufacturing Co., Jönköping.—Sewing machines. 531
18 Procope, Maria, Stockholm.—Sewing machine. 531

Machines for Printing, Making Books, Paper Working, etc.

- 19 Brehmer, E. F. A., Stockholm.—Paper-cutting machine. 546

Motors, Engines, Railway Plant, Marine Models.

Motors, Power Generators, etc.

- 20 Atterberg, A. J., Hagforsen, Rada.—
Drawings of turbines. 551
- 21 Wenstrom, W., Orebro.—Drawing
of a turbine. 551
- 22 Asplund, Harald, Kristinehamn.—
Marine steam engine. 552
- 23 Kockums Machine Manufacturing
Co., Malmö.—Steam engines. 552
- 24 Kopings Machine Manufacturing
Co., Köping.—Cast iron cylinders for a
sixty horse-power propeller steam en-
gine. 552
- 25 Laurenius, Engberg, & Co., Jönkö-
ping.—Rotatory steam engine. 552
- 26 De Laval, G., Falun.—Motors on a
new system. 552
- 27 Runqvist, C. R., Stockholm.
a Steam engine. 552
b Oscillating steam engine governor. 555
- 28 Winterros, C. E., Stockholm.—
Model of a steam engine. 552
- 29 Sandvikens Iron Works Stock Co.,
Sandviken.—Axles for propellers. 553

Hydraulic and Pneumatic Apparatus.

- 30 Morthin, P., Osthhammar.
a Model of an apparatus for pumping
water. 560
b Fire engine. 564
- 31 Atterberg, H. J., Hagforsen, Rada.—
Drawing of blowing engine. 562
- 32 Mendelson, O. & J., Stockholm.—
Fire-escaping apparatus. 564
- 33 Mobergs Machine Manufacturing
Co., Stockholm.—Fire engine. 564

Railway Plant, Rolling Stock, etc.

- 34 Bjorkman, C. R., Kristinehamn.—
Drawing of a narrow-gauge loco-
motive. 570

35 Motala Machine Co., Motala.

- a Locomotive. 570
b Locomotive axles. 573
- 36 Nilsson, N. W., Christianstad.—Au-
tomatic railway couplings. 572
- 37 Sandvikens Iron Works Stock Co.,
Sandviken.—Railway tires and axles. 573
- 38 Adelskold, C. A., Stockholm.—Mo-
del of an axle box for railway cars. 573
- 39 Arboga Foundry and Machine Man-
ufacturing Co., Arboga.—Railway
wheels, tires and axles. 573
- 40 Asplund, Harald, Kristinehamn.—
Railway wheels. 573
- 41 Ekman, Carl, Finspang.—Railway
wheels. 573
- 42 Fagersta Bruks Aktiebolag, West-
anfors.—Railway axles and springs. 573
- 43 Kopings Machine Manufacturing
Co., Köping.—Axles. 573
- 44 Surahammars Works, Surahammar.
—Railway wagon wheels and axles. 573
- 45 Ankarsrums Works, Ankarsrum.—
Railway switches. 574
- 46 Ostrand, Herrman, Helsingborg.—
Drawing of a railway switch. 574

Aerial, Pneumatic, and Water Trans-
portation.

- 47 Lesjöfors Stock Co., Filipstad.—
Wire cables. 591
- 48 Abrahamson, A. F., Ryda, Orsunds-
bro.—Sailing boat. 594
- 49 Royal Centennial Commission.—
Models of fishing boats. 594
- 50 Trygger, Alfred, Goteborg.—Models,
drawings, etc., of sailing vessels, made
by the pupils of the school for navigators
in Goteburg. 594
- 51 Kockums Machine Manufacturing
Co., Malmö.—Models of steamers, and
torpedo boat. 594
- 52 Motala Machine Manufacturing Co.,
Motala.—Steamboat. 595

NORWAY.

(North of North Aisle, Columns 19 to 21.)

Machines, Motors, Ships' Models.

Machines and Implements of Spin-
ning, Weaving, Felting, and Paper
Making.

- 1 O. Jacobsen's Mechanical Works,
Christiania.—Mechanical mangle. 524

Motors, Power Generators, etc.

- 2 Gjerdrum, Otto, Christiania.—Model
of self-acting smoke-consuming apparatus
for boilers. 550
- 3 Klem Hansen & Co., Trondhjem.—
Belting. 553

- 4 Roed Works, near Sandefjord.—Ro-
tating steam-engine with boiler and feed-
water heater. 554

Hydraulic and Pneumatic Apparatus.

- 5 Blunck, C., Christiania.
a Pumps. 560
b Fire-engines. 564

Aerial, Pneumatic, and Water Trans-
portation.

- 6 Arentz, Hjalmar, Christiania.—
Models and drawings of iron ships. 594

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Models of Vessels.

- | | |
|---|--|
| <p>7 Board of Commerce, Aalesund.—
Models of fishing boats. 594</p> <p>8 Brandi, J., Christiania.—Drawings
and models of sailing vessels. 594</p> <p>9 Brunchorst & Dekke, Bergen.—
Models of sailing vessels. 594</p> <p>10 Gran, Jens, Bergen.—Models of sail-
ing vessels. 594</p> | <p>11 Hansen, Carl A., Porsgrund.—
Models and drawings of sailing ves-
sels. 594</p> <p>12 Museum of Bergen, Bergen.—Mod-
els of fishing boats. 594</p> <p>13 Naval Establishment of Carl Johans-
værn, Horten.—Models of boats. 594</p> |
|---|--|

ITALY.

(North of North Aisle, Columns 16 to 19.)

Machines, Drawings, Models.

Machines, Tools, and Apparatus of
Mining, Metallurgy, Chemistry, and
the Extractive Arts.

- | | |
|--|--|
| 1 Paresi, E. Giuseppe, Parma.—Fur-
nace for lime. 506 | 2 Agrarian Committee of Chiavari.—
Sulphur machine. 508 |
|--|--|

Machines and Implements of Spinning,
Weaving, and Paper Making.

- | |
|---|
| 3 Ferrari, Bartolomeo, Parma.—Ap-
paratus for silkworms. 520 |
|---|

Machines for Printing, Making Books,
Paper Working, etc.

- | |
|---|
| 4 Perisi, Achille & Son, Naples.—Pia-
nografo-voltacarte, mechanical inven-
tion. 545 |
|---|

Motors, Power Generators, etc.

- | |
|---|
| 5 Zanini, Pasquale, Rome.—Steam
machine. 550 |
|---|

Hydraulic and Pneumatic Apparatus.

- | |
|---|
| 6 Gasparini, Giacomo, Rome.—Hy-
draulic machine. 563 |
|---|

Agricultural Engineering and Ad-
ministration.

- | |
|--|
| 7 Berteau, Stefano, Alessandria.—Lo-
zenge machine. 582 |
|--|

Aerial, Pneumatic, and Water Trans-
portation.

- | |
|--|
| 8 D'Allessandro, Benedetto, Benve-
nuto, Rome.—Life-preserver. 594 |
| 9 Villa, Cav. Ignazio, Milan.—Draw-
ings of nautical machinery and archi-
tecture. 594 |
| 10 Origone, Paolo, Genoa.—Design for
an iron steamer, and model in relief. 595 |
| 11 Zaffarini, Cav. Cesare, Ferrara.—
Nautical machine. 597 |

BRAZIL.

(South of North Aisle, Columns 16 to 21.)

Explosive and Pyrotechnic Apparatus, Weapons.

Chemical Manufactures.

- | | | |
|---|---|--|
| 1 Souza, Fausto de.—Metal fuses for
artillery. 204 | 2 Pyrotechnical Laboratory, Rio de
Janeiro.
a Fuses for artillery. 204
b Apparatus for guiding signal rockets. 205 | 3 Military Archives of Rio de Janeiro.
—Pyrotechnical maps. 205 |
|---|---|--|

Weapons, etc.

- | |
|---|
| 4 Army Arsenal, Rio de Janeiro.
a Breech-loading rifle, and sword bayonet;
revolver. 265
b Model of rifled brass field gun, with ac-
cessories. 266
c Mounted rifled gun and casemate; brass
rifled gun and accessories; brass mortars;
shot and shell, canister and grape for |
|---|

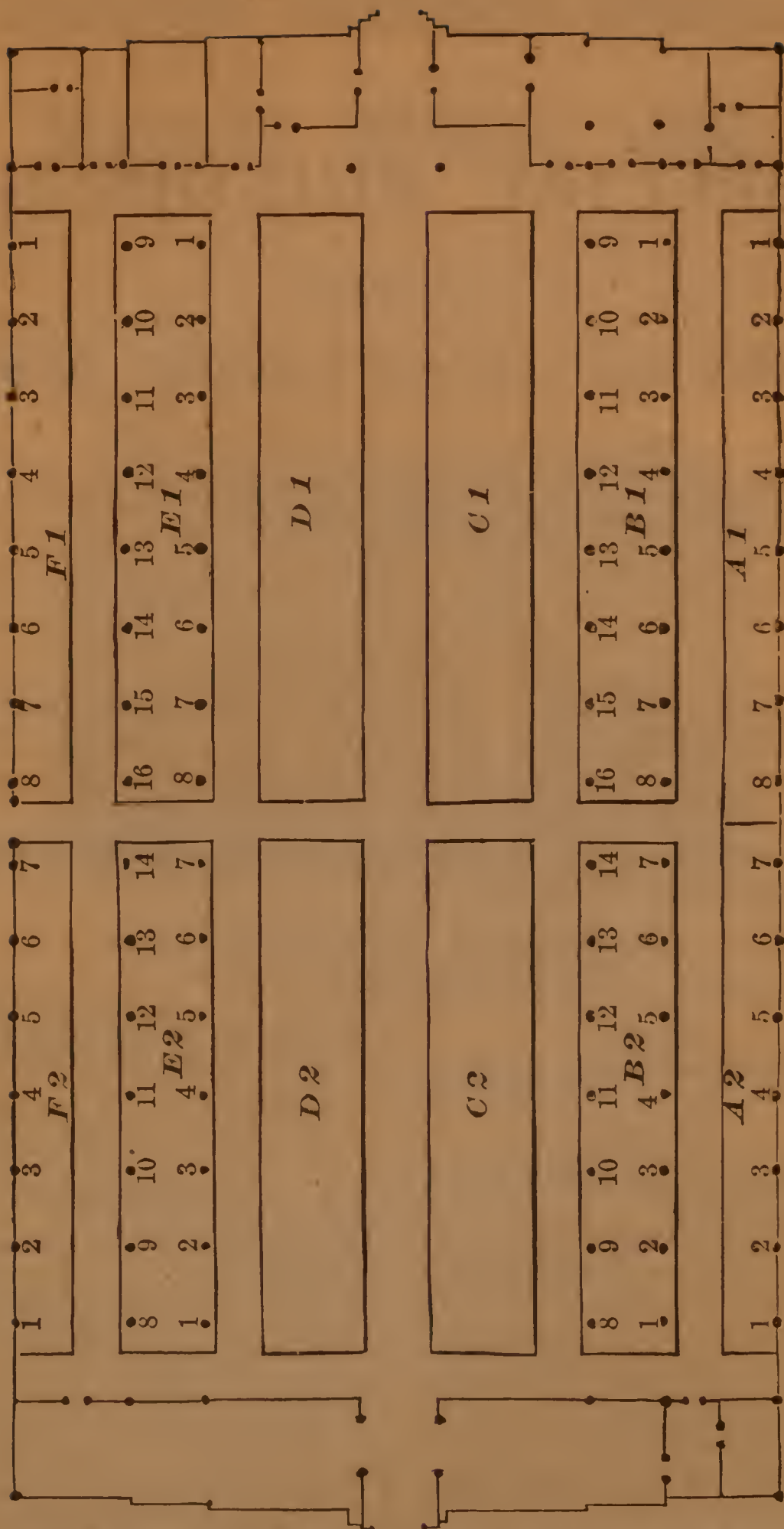
Weapons, Hardware, Motors, Pumps, Ships' Models.

- heavy ordnance; apparatus for guiding rockets, used as a projectile. 267
d Spears. 268
5 Arsenal at Bahia.—Drum used by the Brazilian army. 265
6 Arsenal in the Province of Rio Grande do Sul.—Weapons and articles used by the Brazilian army. 265
7 Navy Arsenal, Rio de Janeiro.
a Leather buckets for artillery service. 266
b Leather cartridge boxes for heavy ordnance. 267
- Hardware, Edge Tools, Cutlery, and Metallic Products.**
- 8 Silvino, Tripo di.**—Hand tools. 280
9 Province of Minas Geraes.—Hand tools and instruments. 280
10 Arsenal of the Province of Bahia.
a Hand tools. 280
b Locks for naval and ships' stores. 284
11 Ipanema Iron Works.
a Hand tools. 280
b Imperial crown and cross of cast iron; samples of cast iron. 283
12 Army Arsenal, Rio de Janeiro.—Cast iron ventilator, and samples of cast iron. 283
13 Santos, Cauto dos.—Imperial crown of cast iron; samples of cast iron. 283
14 Bieunemback & Brother.—Chair of cast iron; samples of iron grates. 283
15 Slichal, Fabiano.—Horse shoes of different shapes. 284
- Engineering, Architecture, Maps, etc.**
16 Navy Yard at Rio de Janeiro.—Models of dry docks cut into the rock. 330
- Motors, Power Generators, etc.**
17 Navy Yard at Rio de Janeiro.—Models of engines for small monitors and mortar ships. 552
18 C6sta, F. C. da.—Model of fire engine. 552
19 Bieunemback & Irmao.—Engine to be used as motor. 552
20 Navy Arsenal, Rio de Janeiro.—Steam engine to be used as motor at the pyrotechnical laboratory at Rio de Janeiro. 552
21 Army Arsenal at Rio de Janeiro.
a Iron drums and chairs for transmitting motion. 553
b Screw and cog wheel for steam launches. 554
- Hydraulic and Pneumatic Apparatus.**
22 C6sta, F. C. da.
a Pumps. 561
b Hydraulic rams. 563
c Nozzle fire plug. 564
23 Navy Yard, Rio de Janeiro.—Models of iron clads, casemate and monitor ships, men of war and steam launches; models of corvettes and launches, designed by Trajano de Carvalho. 595
- Arboriculture and Forest Products.**
24 Navy Yard, Rio de Janeiro.—Samples of wood used for ship building. 600

ARGENTINE REPUBLIC.

Cloth and Paper-Working Machines, Ships' Models.

- Machines and Implements of Spinning, Weaving, and Paper Making.**
1 Provincial Commission, Province of Santiago del Estero.—Weaving loom. 522
- Machines for Printing, Making Books, Paper Working, etc.**
2 Estrada, Angel, Prov. of Buenos Ayres.—Samples of printing, types, electrotypes, corners, etc. 542
3 Cañarte, Bernardo R., Province of Buenos Ayres.—Album of typographic works. 542
- Railway Plant, Rolling Stock, etc.**
4 Gardella, Luis, Province of Buenos Ayres.—Plan of a rotary machine with boiler. 570
- Aerial, Pneumatic, and Water Transportation.**
5 Office of the Harbor Master, Province of Buenos Ayres.—Model of mixed frigate, with wooden hull and auxiliary machine; models of steam lighter, pleasure steam yacht, and whaler. 590
6 Provincial Commission, Province of Corrientes.—Oars. 590
7 Roibon, Federico, Province of Corrientes.—Model of rafts for crossing the "Paso de la Patria" during the war with Paraguay, in 1866. 590



SHOE AND LEATHER BUILDING.—GROUND PLAN.

SPECIAL BUILDINGS.

SHOE AND LEATHER BUILDING. No. 57.

Architect, A. B. BARRY.—Size, 300 feet by 160 feet.

Constructed of wood, one story high, and situated south of Machinery Hall, between it and the barrier. Its name indicates its purpose.

KEY TO THE NOTATION.

THE location of objects in the Shoe and Leather Building is shown by a letter and two figures, indicating the nearest column of the building. The letter and first figure designate the section of the building, the second figure the column within that section. The system of numbering is shown on the annexed ground plan.

The class of the classification to which each exhibit belongs is indicated by the small figures at the end of the line.

Oils, Blacking, Boots and Shoes.

Chemical.

- 1 Dodd, A. W., & Co., Gloucester, Mass.—Oils for tanners' use. F 2-3. 201

Blacking.

- 2 Miller, Frank, Son, & Co., New York, N. Y.—F 1-4.
a Harness oils. 201
b Shoe blacking, leather dressings, etc. 202
- 3 Levi & Berg, Philadelphia, Pa.—Shoe blacking and ladies' shoe dressing. F 1-3. 202
- 4 Annear, John, Philadelphia, Pa.—Shoe blacking and stove polish. F 1-3. 202
- 5 Mason, Jas. S., & Co., Philadelphia, Pa.—Shoe blacking. F 1-5. 202
- 6 Axford & Veron, Philadelphia, Pa.—Shoe blacking. F 1-3. 202
- 7 Bixby, S. M., & Co., New York, N. Y.—Shoe blacking and leather dressing. F 1-4. 202
- 8 Restorff & Bettman, New York, N. Y.—Leather polish for boots, shoes, traveling bags, etc. B 2-2. 202
- 9 Sawyer, H., Boston, Mass.—Crystal blue. F 1-3. 202

- 10 Reed, Geo. H., & Sons, Boston, Mass.—Dressings, inks, varnishes, and stains for leather. F 1-3. 202
- 11 Hauthaway, C. L., & Sons, Boston, Mass.—Leather dressings, blackings, stains, and varnishes. E 1-11. 202

Boots and Shoes.

- 12 Johnson, N. M., St. Louis, Mo.—Boots and shoes. C 2-11. 251
- 13 Wells, M. D., & Co., Chicago, Ill.—Boots and shoes. C 2-11. 251
- 14 Fargo, C. H., & Co., Chicago, Ill.—Women's, misses', and children's shoes; men's boots. C 2-11. 251
- 15 Falley, L., & Co., Lafayette, Ind.—Men's, boys', and women's calf and kip boots and shoes. C 1-15. 251
- 16 Knees, Chas., Frederick, Md.—Cordovan leather patterns for boots and shoes. D 1-8. 251
- 17 Semenety, Rudolf, Cleveland, Ohio.—English top boots. D 2-4. 251
- 18 Stribley & Co., Cincinnati, Ohio.—Ladies', misses' and children's shoes. C 2-13. 251

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Boots and Shoes.

- 19 Hocker, Geo., Cincinnati, Ohio.—Ladies' and gentlemen's boots and shoes. C 1-13. 251
- 20 Kilsheimer, F., Cincinnati, Ohio.—Men's boots, shoes, and gaiters. C 2-13. 251
- 21 Prichard, Smith, & Co., Cincinnati, Ohio.—Boots and shoes. C 2-12. 251
- 22 Alter, Frank, & Co., Cincinnati, Ohio.—C 2-12. 251
- 23 Cincinnati Shoe Manufacturing Co., Cincinnati, Ohio.—Ladies', misses', and children's boots and shoes. C 2-12. 251
- 24 Feary, Thos., & Sons, Albany, N. Y.—Ladies', misses', children's, and infants' shoes. D 1-2. 251
- 25 East New York Boot, Shoe, and Leather Manufacturing Co., Albany, N. Y.—Women's, misses', and children's shoes. C 2-13. 251
- 26 Newcomb & Walker, Elmira, N. Y.—Men's, boys', youths', women's, misses', and children's shoes. C 1-13. 251
- 27 Burt, Edwin C., & Co., New York, N. Y.—Ladies' shoes. C 2-14. 251
- 28 Burt & Mears, New York, N. Y.—Men's boots and shoes. C 2-14. 251
- 29 Bay State Shoe and Leather Co., New York, N. Y.—Boots and shoes. C 2-14. 251
- 30 Thierry, Ernest J., New York, N. Y.—Gentlemen's gaiters, shoes, and slippers. C 2-14. 251
- 31 Brooks, Edwin A., New York, N. Y.—Cork-sole boots and shoes. C 2-13. 251
- 32 Creed, Eugene, New York, N. Y.—Boot, shoe, and gaiter uppers. C 1-15. 251
- 33 Kenny & McPartland, New York, N. Y.—Ladies', misses', and children's shoes. C 2-11. 251
- 34 Leh, H., & Co., Allentown, Pa.—Boots and shoes. D 2-4. 251
- 35 Adler & Clement, Baltimore, Md.—Ladies', misses', and children's shoes; leather tips formed from the sole. D 2-5. 251
- 36 Dixon, W. T., & Bro., Baltimore, Md.—Ladies', misses', and children's shoes. C 2-10. 251
- 37 Banister & Tichenor, Newark, N. J.—Men's and boys' boots, shoes, and slippers. D 2-4. 251
- 38 Canfield, W. B., & J., Newark, N. J.—Gentlemen's boots and shoes. D 2-5. 251
- 39 Miller, McCullogh, & Ober, Newark, N. J.—Gents' boots and shoes. D 2-4. 251
- 40 Brown, Alex. P., & Co., Philadelphia, Pa.—Ladies', misses', children's, and infants' boots and shoes. C 1-15. 251
- 41 Evans, Thos. R., Philadelphia, Pa.—Gaiters, boots and shoes. C 1-12. 251
- 42 Wireman, Henry, Philadelphia, Pa.—Ladies' shoes. C 1-14. 251
- 43 Erskine, M. A., & Co., Philadelphia, Pa.—Ladies' shoes. C 1-12. 251
- 44 Graf, L., & Bro., Newark, N. J.—Boots and shoes. D 2-5. 251
- 45 West Brothers, Philadelphia, Pa.—Ladies', misses', children's, and infants' shoes. C 1-13. 251
- 46 Gates, Allen, & Bro., Philadelphia, Pa.—Ladies' boots, shoes, and slippers. C 1-14. 251
- 47 Sollers, S. D., & Co., Philadelphia, Pa.—Infants' and children's shoes and slippers. C 1-14. 251
- 48 Richelderfer, J. H., Philadelphia, Pa.—Over gaiters and leggings. C 1-13. 251
- 49 Kelley & Moore, Philadelphia, Pa.—Ladies' shoes. C 1-12. 251
- 50 Targett, John, Philadelphia, Pa.—Boot, shoe, and gaiter patterns. C 1-12. 251
- 51 Schmid, Jacob, Philadelphia, Pa.—Ladies' boots and shoes. C 1-12. 251
- 52 Benkert, C., & Son, Philadelphia, Pa.—Gentlemen's boots and shoes. C 1-16. 251
- 53 Zaun, Jacob, & Son, Philadelphia, Pa.—Men's boots and shoes. C 1-13. 251
- 54 Dreisbach, Wm., & Co., Philadelphia, Pa.—Shoe bows and wooden heels. C 1-15. 251
- 55 Heulings, Abram, Philadelphia, Pa.—Boots and shoes, with ice creeper attached. C 1-15. 251
- 56 Meyer, C. A. Adolph, Philadelphia, Pa.—French calf boots, shoes, and gaiters. C 1-12. 251
- 57 Helweg & Co., Philadelphia, Pa.—Boots and shoes. C 1-16. 251
- 58 De Warne, Laurens E., Philadelphia, Pa.—Boots and shoes. C 1-14. 251
- 59 Mayer & Stern, Philadelphia, Pa.—Ladies', children's, and infants' shoes. C 1-12. 251
- 60 Dalsheimer Bros., Philadelphia, Pa.—Ladies', misses', children's, and infants' shoes. C 1-15. 251
- 61 Sausser, Dangler, & Co., Philadelphia, Pa.—Women's, misses', and children's shoes. C 1-13. 251
- 62 Ziegler Bros., Philadelphia, Pa.—Ladies', misses', children's, and infants' shoes. C 1-13. 251
- 63 Laird, Schober, & Mitchell, Philadelphia, Pa.—Boots and shoes. C 1-15. 251
- 64 Schoff, W. L., Philadelphia, Pa.—Children's shoes, and ladies' white kid boots and slippers. C 1-15. 251
- 65 Simonds, N. J., Woburn, Mass.—Bevel and moulded heel stiffenings from leather and leather boards. D 2-6. 251
- 66 Walker, J. H., & G. M., Worcester, Mass.—Boots. D 1-8. 251
- 67 Hamilton Web Co., Wickford, R. I.—Boot and gaiter webs. E 1-6 and 14. 251
- 68 Lilly, Young, Pratt, & Brackett, Boston, Mass.—Men's, boys', and youths' boots and shoes. D 1-3. 251
- 69 Connolly & Power, Boston, Mass.—Gentlemen's boots, shoes, and gaiters. D 2-6. 251
- 70 Haskell, B. C., & Dickerman, Boston, Mass.—Shoe findings, buckles, buttons, laces, button hooks, over gaiters, shoe trimmings, and tools. D 2-7. 321
- 71 Jones, Frederick, & Co., Boston, Mass.—Boots and shoes. D 1-2. 251

Boots, Shoes, Trunks, Harness.

- 72 Batcheller, E. & A. H., & Co., Boston, Mass.—Men's, boys', youths', women's, and misses' boots, shoes, and brogans. D 1-1. 251
- 73 Henshaw, Ed., Boston, Mass.—Shoe findings, tools, store supplies, etc. D 2-7. 251
- 74 Mudge, E. & A., & Co., Boston, Mass.—Boots and shoes. D 1-4. 251
- 75 Lane, Jenkins, & Sons, Boston, Mass.—Boots, shoes, and brogans. D 1-1. 251
- 76 Fogg, Houghton, & Coolidge, Boston, Mass.—Men's, boys', youths', women's, and children's boots and shoes. D 1-1. 251
- 77 Dane, I. F., Grinnell, & Co., Boston, Mass.—Men's boots, brogans, etc. D 1-3. 251
- 78 Robbins & Kelloggs, Boston, Mass.—Women's, misses', and children's shoes. D 1-3. 251
- 79 Emerson's, Thomas, Sons, Boston, Mass.—Men's, boys', and youths' shoes. D 1-1. 251
- 80 Sears & Warner, Boston, Mass.—Shoe manufacturers' goods, lastings, and serges. D 1-8. 251
- 81 Packert, Charles D., & Co., Lynn, Mass.—Ladies' and misses' boots and shoes. D 1-7. 251
- 82 Ventilating Waterproof Shoe Co., Lynn, Mass.—Ladies' and misses' boots. D 1-7. 251
- 83 The Moulded Heel Stiffening Co., Lynn, Mass.—Moulded rubber counters for boots and shoes. D 1-7. 251
- 84 Tebbetts, Charles B., Lynn, Mass.—Ladies' and gents' boots, shoes, slippers, and fancy ties. D 1-7. 251
- 85 Woolredge, A. M., Lynn, Mass.—Ladies' shoes. D 1-7. 251
- 86 Bancroft, E. F., & Co., Lynn, Mass.—Ladies' and misses' boots and shoes, and ladies' and gents' fancy and plain slippers. D 1-7. 251
- 87 Mower & Brother, Lynn, Mass.—Ladies' and misses' boots and buskins. D 2-7. 251
- 88 Sweetzer, C. S., & Co., Lynn, Mass.—Ladies' and misses' boots. D 1-7. 251
- 89 Breed, W. F., Dole, & Co., Lynn, Mass.—Ladies' and misses' boots. D 1-7. 251
- 90 Breed, F. W., Lynn, Mass.—Ladies' boots and shoes. D 1-7. 251
- 91 Breed, A. F., Lynn, Mass.—Men's, ladies', and misses' boots and shoes. D 1-7. 251
- 92 Coffin, C. A., & Co., Lynn, Mass.—Men's boots and shoes. D 1-7. 251
- 93 Mudge, W. R., Lynn, Mass.—Leather, straw, and pattern boards, paper soles, stiffenings, etc. D 1-6. 251
- 94 Sutherland, J. G., Lynn, Mass.—Boot and shoe patterns, and sample boots and shoes. D 1-6. 251
- 95 Buffum, Charles, Lynn, Mass.—Ladies' and misses' boots. D 1-7. 251
- 96 Mower, F. B., Lynn, Mass.—Ladies', misses', and children's boots. D 1-7. 251
- 97 Ordway & Clark, Haverhill, Mass.—Ladies' and gents' walking-boots and slippers. D 1-6. 251
- 98 How, Moses, Haverhill, Mass.—Ladies' and misses' shoes and slippers. D 1-5. 251
- 99 Goodrich & Whitehouse, Haverhill, Mass.—Misses', children's, and infants' boots and shoes. D 1-6. 251
- 100 Goodrich & Porter, Haverhill, Mass.—Ladies' and misses' boots and shoes. D 1-5. 251
- 101 How, George C., Haverhill, Mass.—Kid slippers and ties. D 1-6. 251
- 102 Gardner Bros., Haverhill, Mass.—Ladies' and misses' boots and shoes. D 1-5. 251
- 103 Farrar, John B., Haverhill, Mass.—Gents' boots and opera and low-cut shoes. D 1-6. 251
- 104 Johnson, L., & Co., Haverhill, Mass.—Ladies' and gentlemen's shoes and slippers. D 1-6. 251
- 105 Nichols, George H., & Co., Haverhill, Mass.—Men's boots and shoes. D 1-6. 251
- 106 Goodrich, J., jr., Haverhill, Mass.—Ladies' boots. D 1-6. 251
- Trunks, Valises, etc.
- 107 Simon, Edward, & Bro., New York, N. Y.—Trunks, bags, bag frames and trimmings, and fancy brass goods. G 2. 255
- 108 Lagowitz, J., & Co., New York, N. Y.—Trunks, traveling bags, and satchels. G 2. 255
- 109 Hacker, J. C., & Co., New York, N. Y.—Pocket books, bill books, card and cigar cases, etc. G 2. 255
- 110 Lambert, P. W., & Co., New York, N. Y.—Pocket books, belts, fine zinc toys, and Russia leather goods. G 1. 255
- 111 Gillmore, J. C., & Co., New York, N. Y.—Fine trunks, traveling cases, and bags. G 1. 255
- 112 Thorne, John W., New York, N. Y.—Saratoga trunk and trunk clamp. G 1. 255
- 113 Crouch & Fitzgerald, New York, N. Y.—Trunks, valises, shawl straps, and leather goods. G 1. 255
- 114 Spitzer, Geo. W., New York, N. Y.—Fans, jewelry cases, and fancy leather goods. G 1. 255
- 115 Simpson, J. F., Philadelphia, Pa.—Trunk closer, lock, strap, and socket. G 1. 255
- 116 Watt, F. H., Philadelphia, Pa.—Trunks, traveling bags, and fancy leather goods. G 2. 255
- 117 Unruh, John, & Sons, Philadelphia, Pa.—Leather trunks and valises. G 1. 255
- 118 Waas, H. A., Philadelphia, Pa.—Trunk. G 2. 255
- 119 Palmer, St. George H., Nashville, Tenn.—Army, sportsmen's, travelers', and miners' equipments. G 2. 255
- Hardware, Saddlery.
- 120 Albright, Andrew, Newark, N. J.—Hard rubber-coated harness and carriage trimmings. D 2-2. 284

Harness, Trimmings, Rubber Goods, Machinery.

- 121 Celluloid Harness Trimming Co., Newark, N. J.—Celluloid martingale rings and harness mountings. D 2-1. 284
- 122 Kuenhold, F. B., Newark, N. J.—Saddlery and coach hardware. D 2-2. 284
- 123 Crane & Co., Newark, N. J.—Flexible rubber bits, wrought hand-forged bits. D 2-2. 284
- 124 Theberath, Charles M., & Bro., Newark, N. J.—Fine saddlery, hardware, and trimmings. D 2-3. 284
- 125 Manning & Lyon, Newark, N. J.—Winkers and winker plates. D 2-1. 284
- 126 Buerman, August, Newark, N. J.—Saddlery and harness hardware, bits, spurs, etc. D 2-1. 284
- 127 Wiener & Co., Newark, N. J.—Saddlery, hardware, and trimmings. D 2-1. 284
- 128 Tompkins, Samuel E., & Co., New York, N. Y.—Silver-plated coach and harness hardware. D 2-1. 284
- 129 Waldron, J. V., & Bro., New York, N. Y.—Crests, coats of arms, monograms, bits, bosses, rosettes, etc., for harness. D 2-1. 284
- 130 Reynolds, Samuel, & Co., Pittsburg, Pa.—Saddlery hardware, iron hames, and malleable iron castings. D 2-2. 284
- 131 Jenks, A. S., Philadelphia, Pa.—Bits. D 2-3. 284

Fabrics of Vegetable, Animal, or Mineral Materials.

- 132 Davidson Rubber Co., Boston, Mass.—Rubber goods. C 2-8. 285
- 133 Gossamer Rubber Co., Boston, Mass.—Gossamer water-proof cloaks, coats, and overcoats, hats, caps, and umbrellas. G 1. 285
- 134 Taylor, W. B. S., New York, N. Y.—Flexible tubing, and gas-proof cloth. C 2-9 and 10. 285
- 135 Goodyear Rubber Co., New York, N. Y.—Rubber goods, enameled and table oil cloths. C 2-9 and 10. 285
- 136 National Rubber Co., Providence, R. I.—Rubber boots, shoes, clothing, cloths, stationers' and druggists' articles, mats, belting, hose, cushions, beds, pillows, etc. C 2-9. 285
- 137 New Brunswick Rubber Co., New Brunswick, N. J.—Rubber boots and shoes. C 2-11. 285
- 138 Vulcanized Fibre Co., Wilmington, Del.—Hard and flexible goods of vulcanized fibre. G 1. 285
- 139 Chadeayne & Christian, Yonkers, N. Y.—Rubber boots. G 1. 285

Carriages, Vehicles, and Accessories.

- 140 Peters & Calhoun Co., Newark, N. J.—Harness, saddles, and bridles. E 1-12. 296
- 141 Clements, J., & Bro., Newark, N. J.—Saddlery and fancy leather goods. E 1-13. 296
- 142 Kessler & Bro., Philadelphia, Pa.—Wooden and plated harness. E 1-5. 296

- 143 Haedrick, Henry G., & Sons, Philadelphia, Pa.—Harness and saddlery; preparation for polishing and dressing harness. E 1-10. 296
- 144 Moyer, E. P., & Bros., Philadelphia, Pa.—Harness, saddlery, and trunks. E 1-3. 296
- 145 Hansell, W. S., & Sons, Philadelphia, Pa.—Harness and saddlery, and horse clothing. E 2-4. 296
- 146 Lynch, Anthony, Philadelphia, Pa.—Gold-mounted double and single harness. E 1-10. 296
- 147 Sallada & Pearson, Philadelphia, Pa.—Ladies' and gentlemen's riding and driving whips. E 1-13. 296
- 148 McFadden, Patrick, Philadelphia, Pa.—Single harness and saddlery. F 1-1. 295
- 149 Yeager, Daniel A., Media, Pa.—Double and single harness, riding saddles, and bridles. E 1-2. 296
- 150 Wilson, R. F., Milton, Pa.—Fly nets. E 1-4. 296
- 151 Weaver & Bardall, Western Penitentiary, Pittsburg, Pa.—Leather whips. E 1-13. 296
- 152 Moseman, C. M., & Bro., New York, N. Y.—Single and double harness and saddlery. E 1-1 and 9. 296
- 153 Koine & Currie, New York, N. Y.—Single and double harness. E 1-5. 296
- 154 Moore, Thomas, New York, N. Y.—Plain and fancy horse collars. E 1-2. 296
- 155 Manheim, William, New York, N. Y.—Harness loops and back curtain loops. F 1-2. 296
- 156 American Whip Co., Westfield, Mass.—Driving and riding and leather whips and lashes. F 1-1. 296
- 157 Wilder, J. Lyman, Hartford, Conn.—Patent leather harness work, rosettes, etc. E 1-5. 296
- 158 Hill, James R., & Co., Concord, N. H.—Single and double harness and collars. E 1-1 and 9. 296
- 159 Gale, A. D., Pittsfield, Mass.—Double coach harness and paper trunk. E 1-6. 296
- 160 Motts, George, Washington, D. C.—Gold mounted buggy harness. E 1-4. 296
- 161 Lighthouse, J. C., Rochester, N. Y.—Horse collars and pads. E 1-5. 296
- 162 Stewart, John P., Rochester, N. Y.—Carriage and draft horse collars. E 1-13. 296

Leather Machinery.

- 163 Pusey, Jones, & Co., Wilmington, Del.—Tanning apparatus and glazing machine for morocco factory. E 2-3 and 12. 532
- 164 Walters, G. C., Philadelphia, Pa.—Wet-skin sewing machine. E 2-2 and 9. 532
- 165 Langfeld, I., & Sons, Philadelphia, Pa.—Pocket books and fancy leather goods. E 2-3 and 10. 532
- 166 Horn, W. H., & Bro., Philadelphia, Pa.—Tanners', curriers', and shoemakers' tools and machinery. E 2-11. 532
- 167 Osborne, C. S., & Co., Newark, N. J.—Saddlers' and harness makers' tools. E 2-4 and 11. 532

Leather and Shoe Machinery, Leather.

- 168 Knox, David, Lynn, Mass.—Pebbling and polishing machine; sole-cutting machine. F 2-4. 532
- 169 Coogan, Owen, Pittsfield, Mass.—Boarding and graining machine. E 2-10. 532
- 170 Reed, Harvey, Vineland, N. J.—Combination tannery. F 2-5. 532
- 171 Lockwood, Frederick A., Fall River, Mass.—Automatic leather-scouring machine. E 2-12. 532
- 172 Baker, George W., Wilmington, Del.—Skin-sewing machine. E 2-9 and 2. 532
- 173 Fisk, Joseph E., Salem, Mass.—Leather-whitening and buffing machine. E 2-10. 532
- 174 Lampert, Henry, Rochester, N. Y.—Round beam hide worker. E 2-9. 532
- 175 Rosensheel, W. H., Johnstown, Pa.—Model of leather-dressing machine. F 2-5. 532
- 176 Thompson & Navell, Boston, Mass.—Bark-cutting and bossing machine. F 2-6. 532
- 177 Swain, Fuller, & Co., Lynn, Mass.—Beating-out, moulding, and buffing machines. E 1-6 and 14. 532
- 178 Plummer, W. E., Boston, Mass.—Leather, buffing, whitening, and skiving machine; rotary tan press; round leach for leaching bark. E 2-12. 532
- 179 Gibson, F. N., New Ipswich, N. H.—Raising, creasing, and waving machine for harness makers, etc. F 2-6. 532

Shoe Machinery.

- 180 Tapley Heel Burnishing Machine Association, Boston, Mass.—Heel-burnishing machine. E 1-7 and 15. 533
- 181 Tubular Rivet Co., Boston, Mass.—Rivets for boots, shoes, harness, belting, etc. F 2-6. 533
- 182 American Shoe Tip Co., Boston, Mass.—Boots and shoes with wire-quilted soles and toe protection. F 2-7. 553
- 183 Reversible Boot Heel Co., Providence, R. I.—Reversible boot heel. E 1-15. 533
- 184 Howe Machine Co., Bridgeport, Conn.—Boot and shoe sewing machines. F 2-3. 533
- 185 Buzzell, J. G., & Co., Lynn, Mass.—Buffing and heel securing machines. F 2-6. 533
- 186 Carver Cotton Gin Co., East Bridgewater, Mass.—Leveling, counter skiver, and welt cutter, and shank machines. F 2-5. 533
- 187 McKay Sewing Machine Association, Boston, Mass.—Shoe sewing and riveting machines. E 2-15. 533
- 188 May, Withey, & Drake, Lynn, Mass.—Shoe drying machine. F 2-6. 533
- 189 Stimpson, Edwin B., New York, N. Y.—Shoe machinery. E 1-6 and 14. 533
- 190 Hañan & Dewees, New York, N. Y.—Cutting dies and punches, shoe patterns, and lasts. F 2-5. 533
- 191 Hautin Sewing Machine Co., New York, N. Y.—Shoe sewing machine. E 2-11. 533

- 192 S. W. Jamison Boot and Shoe Crimping Machine Co., New York, N. Y.—Steam boot and shoe crimping machine. E 2-6 and 13. 533
- 193 Goodyear & McKay Sewing Machine Association, Boston, Mass.—Shoe sewing machines. E 1-8 and 16. 533
- 194 Graves, L. S., Rochester, N. Y.—Machines for stripping, splitting, rolling, and moulding, and heel pressing. E 2-7 and 14. 533
- 195 Proser, T. T., Chicago, Ill.—Boot and shoe nailing machine. E 2-5 and 12. 533
- 196 Cutlace Shoe Sewing Machine Co., Philadelphia, Pa.—Turned shoe sewing machine, channeler and edge turner. F 1-8. 533
- 197 Redifer, S. S., Philadelphia, Pa.—Shoe lasts, patterns, and dies. D 2-2. 533
- 198 Miller, Thomas L., Philadelphia, Pa.—Beveling, channeling, moulding, and sewing machines for shoes. F 2-4. 533
- 199 Stoops, A. T., Philadelphia, Pa.—Circular-feed sewing machine. E 2-11. 533
- 200 Cushman, C. S., Philadelphia, Pa.—Leather and shoe stitching attachment. E 2-4 and 11. 533
- 201 Evans, Thomas R., Philadelphia, Pa.—Boot and shoe tree, lengthener, stretcher, and lasts. E 2-3. 533
- 202 Smith, J. Barton, & Co., Philadelphia, Pa.—Rasps and files for shoe-makers and manufacturers. E 2-13. 533
- 203 Graf, Leopold, Newark, N. J.—Shoe burnishing and polishing machine. F 2-4. 533

Animal and Vegetable Products.

- 204 Wedekind, Hallenburg, & Bro., Louisville, Ky.—Oak sole leather. A 2-3. 652
- 205 Trautwein, C., & Co., Louisville, Ky.—Chestnut oak sole leather. A 2-3. 652
- 206 Stod, J. B., & Co., Louisville, Ky.—Oak skirting leather. B 2-3 to 10. 652
- 207 Ohio Falls Oak Leather Co., Louisville, Ky.—Oak harness, bridle, and belting leather. A 2-3. 652
- 208 Conrad, Fabel, & Mooney, Louisville, Ky.—Oak sole leather. B 2-3 to 10. 652
- 209 Schellberg, B. F., Germania P. O., Ala.—Rough leather. A 2-7. 652
- 210 Burt, F. H., & Son, Mannington, W. Va.—Oak sole leather. A 2-7. 652
- 211 Wisconsin Leather Co., Milwaukee, Wis.—Sole, upper, and harness leather. A 1-5, B 2-5. 652
- 212 Hidden, E. S., Milburn, N. J.—Leather braids, fibre, in boards and loose, washers, etc. A 2-3. 652
- 213 Hurkamp, J. G., Fredericksburg, Va.—Virginia sumac. A 2-3. 652
- 214 Leas, McVitty, & Sons, Philadelphia, Pa.—Oak sole leather. A 2-6. 652
- 215 Keen & Coates, Philadelphia, Pa.—Oak-tanned sole leather for finest boot and shoe work. A 2-6. 652

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- 218 Shriver, A. K., & Sons, Union Mills, Md.—Oak sole leather. A 1-5. 652
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- 222 Spanogle & Pennabaker, Philadelphia, Pa.—Oak sole leather. A 2-6. 652
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- 228 Rife, Henry J., Philadelphia, Pa.—Sole and harness leather, and finished calf skins. A 2-5. 652
- 229 Forepaugh, W. F., & Bro., Philadelphia, Pa.—Oak-tanned whole hides. A 1-4. 652
- 230 Leas, Wm. B. Shirley, Tannery, Philadelphia, Pa.—Oak sole leather. A 1-4. 652
- 231 Hoffman, Jacob, Philadelphia, Pa.—Oak sole leather. A 2-5. 652
- 232 Rosensteel, W. H., Johnstown, Pa.—Union crop leather. A 1-7. 652
- 233 Hardenburgh, Elmore, & Co., English Centre, Pa.—Sole leather. A 1-5. 652
- 234 Howard, J. H., & A. P., Corry, Pa.—Hemlock sole leather. A 1-5. 652
- 235 Greenawalt, J., & J. K., Harrisburg, Pa.—Oak sole and upper leather, calf, kip, and harness. A 2-6. 652
- 236 Wilkinson, J. P., & Bro., Unionville, Pa.—Oak sole and harness leather. A 2-7. 652
- 237 Underhill & Noble, Athens, Pa.—Hemlock sole leather. A 1-7. 652
- 238 Ray, Daniel P., sr., Tyrone, Pa.—Union crop sole leather. A 2-7. 652
- 239 Webb, Wm. B., Frankford, Pa.—Leather aprons for worsted machinery, picker, band, and lace leather. A 2-7. 652
- 240 Bechtel, John A., & Son, Newport, Pa.—Oak sole leather. A 2-6. 652
- 241 Mosser & Keck, Allentown, Pa.—Union crop backs. A 2-7. 652
- 242 Geneseman, Miller, & Co., Pinegrove, Pa.—Oak slaughter sole leather. A 2-7. 652
- 243 Rippman, C. A., Newport, Pa.—Slaughter sole and rough skirting leather. A 2-7. 652
- 244 Kerper, Henry, Reading, Pa.—Oak sole leather. A 2-7. 652
- 245 Bare, John, Baltimore, Md.—Union crop sole leather. A 2-7. 652
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- 249 Smith, Elliot, & Co., Baltimore, Md.—Oak sole leather. A 2-3. 652
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- 251 Palmer & Decker, Elmira, N. Y.—Union back sole leather. A 2-4. 652
- 252 Kinley, Adam, Breesport, N. Y.—Union crop sole leather. A 2-5. 652
- 253 Osterhout, W. H., Ridgway, Pa.—Hemlock sole leather. A 1-8. 652
- 254 Wilcox Tanning Co., Wilcox, Pa.—Hemlock sole leather. A 1-8. 652
- 255 Innes, Adam, Granville Centre, Pa.—Union slaughter backs sole leather. A 1-8. 652
- 256 Innes, Adam, Grovers, Pa.—Crop sole leather. A 1-8. 652
- 257 Childs & Bloomer, Nicholson, Pa.—Slaughter crop sole leather. A 1-8. 652
- 258 McKenstry & Childs, Schultzville, Pa.—Slaughter crop leather. A 1-8. 652
- 259 Hoyt, J. B., & Co., New York, N. Y.—Oak-tanned leather belting. A 1-4. 652
- 260 Hoyt Brothers, New York, N. Y.—Hemlock sole leather. A 2-7. 652
- 261 Brown, E. T., & Co., Luzerne Tannery, New York, N. Y.—Union crop sole leather. A 2-4. 652
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- 267 Horton, G. B., & Co., New York, N. Y.—Hemlock sole leather. A 1-7. 652
- 268 Lapham, H. G., Tunkhannock Tannery, Tunkhannock, Pa.—Union back sole leather. A 2-4. 652
- 269 Rockwell Bros., Clarendon Tannery, Warren, Pa.—Hemlock sole leather. A 1-7. 652
- 270 Costello, P. & P., Camden Tannery, Camden, N. J.—Hemlock sole leather. A 1-7. 652
- 271 Beach & Dodge, Harrisville, Lewis Co., N. Y.—Hemlock sole leather. A 2-7. 652

Leather.

- 272 Adams & Shaler, New York, N. Y.
—Sole leather. A 1-8. 652
- 273 Thomas Extract Co., Elmira, N. Y.
—Sole leather. A 2-5. 652
- 274 Perry, F. H., & Co., Limestone,
N. Y.—Hemlock sole leather. A 1-7. 652
- 275 Lampert, Henry, Rochester, N. Y.
—Sole and upper leather. E 2-9. 652
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N. Y.—Hemlock sole leather. A 1-5. 652
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—Hemlock sole leather. A 1-5. 652
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tucket, R. I.—Belting lace and hame
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N. Y.—Hemlock sole leather. A 1-
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City, Pa.—Harness leather. B 2-12. 652
- 303 Holstein, A., Alleghany City, Pa.—
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- 304 Lappe & Hax, Alleghany City, Pa.
—Harness leather. B 2-5. 652
- 305 Lappe, J. C., Alleghany City, Pa.—
Harness leather. B 2-5. 652
- 306 Callery, Jas., & Co., Pittsburg, Pa.
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5. 652
- 307 Braun, Frederick, Philadelphia,
Pa.—Calf and kip skins. B 2-13. 652
- 308 Ludy, C., & Sons, Philadelphia,
Pa.—Finished oak calf skins. B 2-13. 652
- 309 Wensley, Jas., Philadelphia, Pa.—
Shoe uppers. B 2-13. 652
- 310 Schuman, F., & Son, Philadelphia,
Pa.—Calf and kid leather. B 1-6. 652
- 311 Chambers, Edwin, West Chester,
Pa.—Finished calf skins. B 2-6. 652
- 312 Mardorf, C., Freeport, Pa.—Har-
ness, calf, veal kip, and upper-leather.
B 2-13. 652
- 313 Hollinger, Amos, Lancaster, Pa.—
Oak harness leather. B 1-4. 652
- 314 New York Manufacturing Leather
Co., New York, N. Y.—Leather cloth for
upholstering and carriages. B 2-5. 652
- 315 Moffat, David, & Co., New York,
N. Y.—Oak-tanned harness leather. B
2-7. 652
- 316 Michel, A. M., New York, N. Y.—
Buff, grain, and calf skins; harness
leather; boots and shoes. B 2-5. 652
- 317 Brown, Elijah T., & Co., New
York, N. Y.—Finished calf skins. B
2-12. 652
- 318 Shattuck & Binger, New York, N.
Y.—Tanned alligator skins, black and
colored. B 2-12. 652
- 319 Studwell, Sanger, & Co., New York,
N. Y.—Imitation goat, splits and buff;
finished calf, russet and union backs. B
2-12. 652
- 320 Haubner & Heller, New York, N.
Y.—Finished calf and kip skins. A 2-
3. 652
- 321 Thomas Extract Co., Elmira, N. Y.
—Leather tanned with hemlock extract
solely, also in combination with other
materials. B 2-12. 652
- 322 Weed, J. B. & F. M., & Co., Bing-
hamton, N. Y.—Imitation goat, split,
kip, and harness leather. B 2-12. 652
- 323 Miller, J. & J., & Co., Boston, Mass.
—Hemlock extract and leather tanned by
same. B 2-2. 652
- 324 Osborne, F., jr., & Co., Boston,
Mass.—New Orleans kip leather, plain
and buffed. B 2-2. 652
- 325 Butler, Dunn, & Co., Boston, Mass.
—Buff leather made from slaughter hides.
B 2-1. 652
- 326 Thompson, B. F., & Co., Boston,
Mass.—Buff, imitation goat and split
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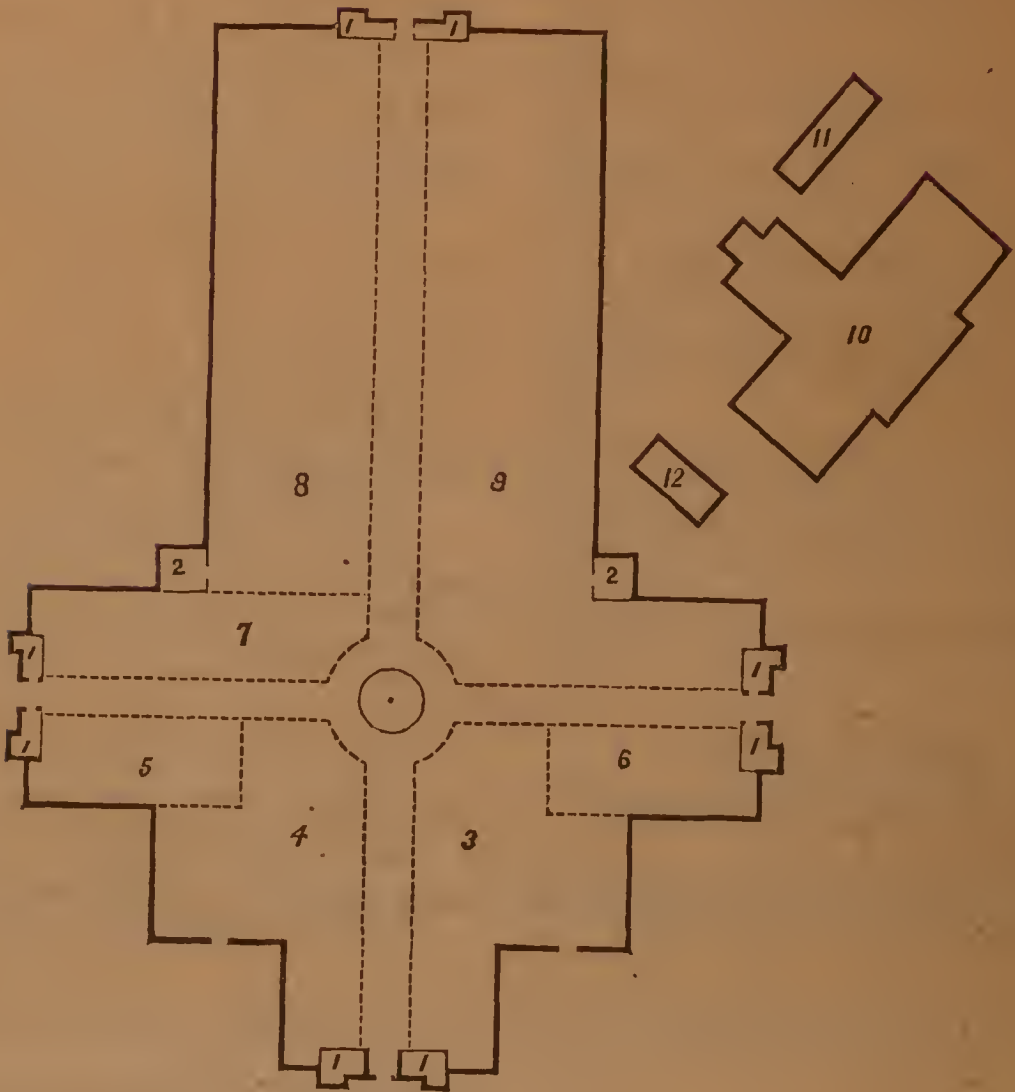
- 299 Groetzinger, A. & J., Alleghany
City, Pa.—Oak sole leather. A 2-
4. 652
- 300 Alexander, E. H., Alleghany City,
Pa.—Imitation French calf and kip skins.
B 2-13. 652

Leather.

- 327 Cummings, John, & Co., Boston, Mass.—Imitation goat, polish grain, calf, split, and buff leather. B 2-2. 652
- 328 Guild, Josiah F., Boston, Mass.—Pebble grain, imitation goat, buff, and split leather. B 2-9. 652
- 329 Procter, Thomas E., Boston, Mass.—Curried leather and splits. B 2-8. 652
- 330 Way, John S., & Co., Bridgeport, Conn.—Leather, buffalo robes. B 2-12. 652
- 331 Zipp, Philip C., Baltimore, Md.—Calf, kip, and grain leather. B 2-6. 652
- 332 Appold, George, & Sons, Baltimore, Md.—Chestnut, oak-tanned calf skins. B 2-4. 652
- 333 Sharp, Tudor, & Co., Baltimore, Md.—Oak buff upper leather, and rough skirting. A 2-7. 652
- 334 Cunningham & Co., Nashville, Tenn.—Oak harness and rough leather. B 2-1. 652
- 335 Trostel & Galloway, Milwaukee, Wis.—Harness, upper, and split leather, and calf skins. B 2-8. 652
- 336 Wisconsin Leather Co., Milwaukee, Wis.—Harness, wax upper, and split leather. B 2-5. 652
- 337 National Leather Co., Detroit, Mich.—Whip, lace, and upper leather, calf skins and robes. A 2-2. 652
- 338 Weil, J., & Bros., Chicago, Ills.—Upper, harness, kip, and calf leather. B 2-8. 652
- 339 Walker, Oakley, & Co., Chicago, Ills.—Wax calf union tannage, imitation goat grains, wax upper, card leather. B 2-8. 652
- Morocco and Sheep.**
- 340 Foster, A. J., & Co., Boston, Mass.—Grain leather, goat and sheep skins. B 2-14. 652
- 341 Ely, Henry G., & Co., New York, N. Y.—Imitation goat pebbled leather, finished wax-split leather. B 2-14. 652
- 342 Rockwell, J. S., & Co., New York, N. Y.—Sheep leather. B 1-16. 652
- 343 Guion, Geo. G.—New York, N. Y.—Morocco leather. B 1-7. 652
- 344 Howell, T. P., & Co., Newark, N. J.—Harness, patent, Russia, and pocket-book leather, sheepskin mats, and roans. B 1-8. 652
- 345 Meyer, Richard, New Durham, N. J.—Buck skins. B 1-14. 652
- 346 Pusey, Scott, & Co., Wilmington, Del.—Kid, straight-grain pebbled, and French morocco. B 2-7. 652
- 347 Jones, Wm., & Co., Wilmington, Del.—Morocco leather. B 2-14. 652
- 348 Bush, Wm., & Co., Wilmington, Del.—Morocco leather. B 1-8. 652
- 349 Larrabee, E., & Sons, Baltimore, Md.—Colored roans and linings, buff splits and wax uppers. B 1-15. 652
- 350 Wentz & Clark, Philadelphia, Pa.—Morocco leather. B 1-14. 652
- 351 Bockius, Geo., Philadelphia, Pa.—Morocco leather. B 1-5. 652
- 352 Wood, Geo., Philadelphia, Pa.—Morocco and sheep leather. B 1-13. 652
- 353 Schollenberger, Wm., & Sons, Philadelphia, Pa.—Calf, kid, sheep alum, and roan leather; satchels, pocket books, and fancy leather goods. B 1-12. 652
- 354 Amer, Wm., & Co., Philadelphia, Pa.—Morocco leather. B 1-4. 652
- 355 O'Callaghan, Francis O., Philadelphia, Pa.—Skivers and sheep skins. B 1-13. 652
- 356 Hummel, G. W., & Co., Philadelphia, Pa.—Morocco leather. B 1-12. 652
- 357 McNeely & Co., Philadelphia, Pa.—Morocco leather, sheep skins, and skivers. B 1-4. 652
- 358 Adams & Keen, Philadelphia, Pa.—Morocco and kid leather. B 1-14. 652

THE UNITED STATES GOVERNMENT'S BUILDING.

Scale, 150 ft. to 1 in.



- | | |
|-------------------------|---|
| 1. Offices. | 7. Agricultural Department. |
| 2. Water-closets. | 8. Interior Department. |
| 3. War Department. | 9. Smithsonian Institution and Food Fishes. |
| 4. Navy Department. | 10. United States Hospital. |
| 5. Post Office. | 11. Tent. |
| 6. Treasury Department. | 12. Laboratory. |

Total Length, 504 ft.

Width, 360 ft.

Height, 50 ft.

H. T. MUNSON,
Late Principal Examiner, U. S. Patent Office.

M. B. PHILIPP,
Late Examiner of Interferences, U. S. Patent Office.

MUNSON & PHILIPP, COUNSELORS IN PATENT CAUSES.

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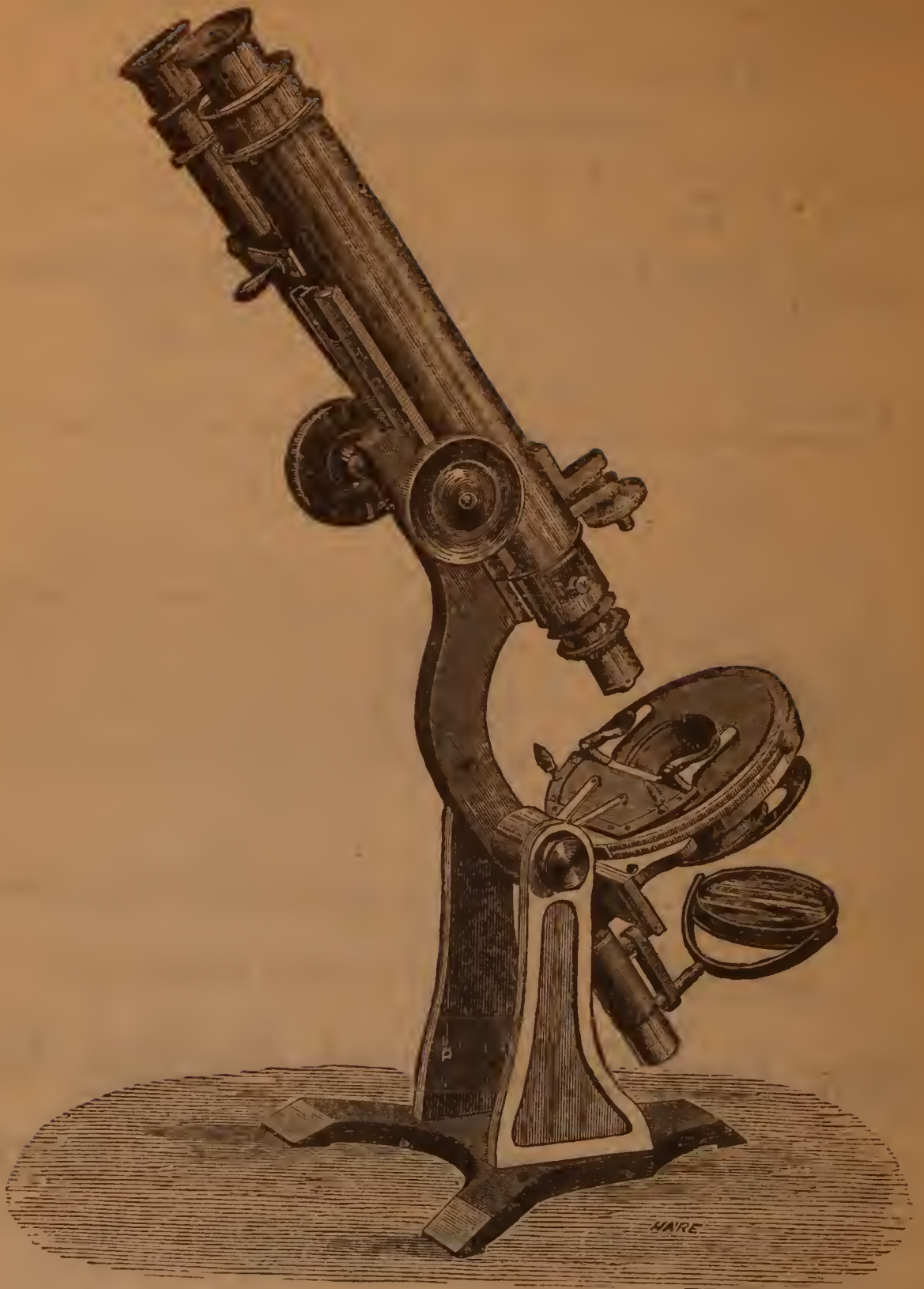
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WM. A. DECAINDRY, Secretary of the Board.

UNITED STATES GOVERNMENT BUILDINGS.

MAIN BUILDING, No. 100.

Architect, JAS. H. WINDRIM.—Size, Floor Area, 102,840 sq. ft.

This structure is situated at the intersection of Belmont and Fountain Avenues, is built in the form of a Latin cross, and is of framed white pine, unplanned, with two tiers of windows. It contains for exhibition contributions from the different Executive Departments of the United States Government.

ORDNANCE LABORATORY BUILDING, NO. 102.

Architect, Col. T. T. S. LAIDLEY, Ordnance Corps, U. S. A.—Size, 53 ft. x 23 ft.

This building is located north of Main Building, and is built of wrought iron, rivetted, covered with a light casing of wood. It is designed with the view of preventing the great loss of life that usually results from the demolition of a building of ordinary construction, by the explosion of even a small amount of powder. In the event of an explosion in this building, the roof and sides fall at once, and the iron frame is left standing, in order to shield the inmates from being crushed beneath the ruins. The building, as well as its contents, is on exhibition.

UNITED STATES ARMY POST HOSPITAL, NO. 101.

Size, 35 ft. x 39 ft., and Addition of 40 ft. x 14 ft.

This Hospital is situated north of the Main Building, is two stories in height, and is intended to hold twenty-four beds. It is built of wood, and contains medical appliances of all kinds, including medicines, instruments, hospital stores, clothing, books, and furniture, models of hospitals, cars, boats, ambulances, etc., microscopical and other specimens. The construction of the building and its contents are on exhibition.

TRANSIT OF VENUS BUILDINGS, NO. 104.

This structure is situated southwest of Government Building, consisting of,—

1. Transit House.—Dimensions, 10 ft. x 8 ft.
2. Photographic House.—Dimensions, 12 ft. x 10 ft.
3. Equatorial House.—Dimensions, 11 ft. in diameter.

All the instruments employed in observing and recording the phenomena of the late transit of Venus are so placed on exhibition that the various processes will be exemplified by practical workings.

WAR DEPARTMENT.

Signal Section.

SIGNAL SECTION.

The instruments exhibited in the Signal Service Section of the United States Army are all of American manufacture, and only such as have been devised for the signal service of the army by officers or enlisted men of the corps.

METEOROLOGICAL INSTRUMENTS.

The display of self-recording instruments consists of barographs, anemographs, thermographs, rain-gauges, and evaporator. Some of these are worked by electrical batteries, others by mechanical means. Those recording the velocity and direction of the wind, the amount of rainfall and changes of temperature, are connected with their respective wind-cups, wind-vanes, rain-receivers, and thermometers, exposed upon an artificial glass roof, beneath which the recording apparatus is placed, each electrical instrument having its own battery. Artificial currents of air and water are used to obtain uninterrupted working.

UNITED STATES SIGNAL STATION.

This department consists of a model United States signal service station, similar to those established in different sections of the United States. Here are exhibited the meteorological instruments used on station; the manner

of taking, recording, and transmitting to the central office at Washington the observations upon which the weather reports, storm warnings, etc., are based; the method of publishing and distributing the predictions forwarded from the office of the Chief Signal Officer of the army, as well as the various means adopted to furnish at the earliest practicable moment all weather information which would be of benefit to commerce and agriculture. Specimens of the publications, charts, and maps of the office of the Chief Signal Officer are also exhibited.

PRINTING DEPARTMENT.

Here are exhibited in detail the printing of "weather maps" and "farmers' bulletins."

FIELD WORK.

This portion of the exhibition comprises a complete United States field-telegraph train, with capacity to erect 50 miles or more of portable telegraph line; portable signal tower 75 feet high, with its wagon; semaphore, signal flags, torches, rockets, bombs, and mortars, colored lights, heliographs (for communicating by means of sun flashing), and international flags, and other apparatus used in communicating with troops in the field or with vessels.

Quartermaster, Medical, Engineer Sections.

MODEL DEPARTMENT.

The model department comprises models of the different instruments used in field signaling, models of station meteorological instruments and portable instrument shelter, and a new electrical instrument for transmitting by telegraph the isobârometric and isothermal lines of the Signal Service weather maps.

QUARTERMASTER SECTION.

Uniforms.—Revolutionary uniforms, and those of succeeding years; present uniforms of the army.

Camp and Garrison Equipage.—Tents, flags, cooking utensils and tools; field music—drums, bugles, etc.; bunks, blankets, and bedsacks.

Means of Transportation.—Wagon and harness; ambulance and harness; aparajo; pack saddle; historic wagon; portable and traveling forges.

Machines.—For cutting out clothing; for brass screwing shoes; for testing fabrics.

Farriers' and Saddlers' Tools.

Standard Horse Shoes.

Veterinary Chest.

Kiernan's System of Horse Shoeing.

MEDICAL SECTION.

This display represents the character of the work of the medical staff of the United States army in peace and war. Four classes of objects are exhibited by the objects themselves, by models, or by photographs.

1. Hospitals for Sick and Wounded Soldiers.

a Post hospital of 24 beds of full size.

b Four full-sized hospital tents, with furniture representing the tent ward which served as the unit of the "tent field hospital" used during the civil war of 1861-65.

c Models of the barrack "General Hospitals" used during the war of 1861-65, viz.: a model of the form of barrack ward for 60 beds, on the scale of half an inch to the foot; and four ground-plan models showing combinations of such wards in general hospitals.

2. Medical and Hospital Supplies.

Samples of articles on the medical supply table of the army; medicines; hospital stores; surgical instruments and dressings; hospital furniture, bedding, clothing, and appliances; books, blank forms for reports, and stationery; medical panniers and medicine wagons, and samples of the artificial arms, legs, trusses, and other apparatus issued by the medical department to disabled soldiers.

3. Transportation of Sick and Wounded.

Stretchers, litters, and ambulances, full size and models; models of hospital railroad cars, hospital steamboat, and hospital ocean steamship, illustrating mode of transporting sick and wounded during the late war.

4. Treatment of Diseases and Injuries of Soldiers.

Army medical museum, represented by medical, surgical, anatomical, and microscopical specimens, photographs of specimens, and catalogue of museum; catalogue of Surgeon-General's office; photographed title pages of rare books on military medicine and surgery, etc.; medical and surgical publications of Surgeon-General's office.

The Post Hospital, for twenty-four beds, constructed from plans approved by the War

Department, contains the greater part of the display of the Medical Department, as follows:

Room 1, 4x25, a ward with twelve beds, furniture, bedding, clothing, etc.

Room 2 (the other ward, same size), models of hospitals, ambulances, hospital cars, boats, and ships, specimens from museum, etc.

Room 3, the dispensary, samples of medical supplies.

Room 4, the office, samples of surgical instruments, medical and surgical books, blanks, etc.

Room 5, dining room, table ware, mess furniture.

Room 6, kitchen, cooking apparatus.

Room 7, office of officer in charge of the display.

Rooms on second floor, stretchers, litters, medicine chests, and panniers; artificial legs and arms, trusses for rupture, and other apparatus.

Tent ward, full-sized hospital tents, pitched in the rear of the post hospital.

Ambulances, medicine wagons, and carts, full-sized, parked near the tent ward.

ENGINEER SECTION.

Maps and Drawings.

Map of the United States, showing work done by corps of engineers, 1776-1876.

Drawing of Rock Island bridge.

Map of canal and locks, Des Moines rapids.

Map of Mississippi river, from Le Claire, Iowa, to Rock Island, Illinois.

Drawings of improvements of Mississippi river between mouths of the Illinois and Ohio.

Plans of improvements on Hudson river, near Albany.

Drawing of iron landing pier, Delaware breakwater harbor.

Drawing of foundation of Fort Delaware.

Drawing of dynamometer for determining force required to screw down iron piles of Lewes pier.

Drawing of Delaware breakwater, with details of breakwater and ice barrier.

Map of shore of Delaware harbor, including Cape Henlopen.

Chart of Schuylkill river, from mouth to Chestnut Street bridge, showing improvements made by United States in its navigation from 1870 to 1875.

Drawing of dredge-boat "Henry Burden."

Drawing of mortar mill and concrete mixer.

Map of flood plain of Minnesota and Mississippi rivers, showing connection with basin of Red River and Lake Winnipeg.

Drawings of snag boat.

Chart of Galveston entrance.

Detailed drawings and photographs, illustrating experimental works at Galveston entrance.

Chart of Indianola harbor.

Detail drawings of end dock.

Charts of Lake Survey.

Lighthouse drawings, Eleventh district.

Drawing of river and harbor works.

Plans of cribs and pile pier at Chicago.

Maps and hydrographs of Ohio, Monongahela, and Great Kanawha rivers.

Drawings of crib work for piers on Lake Ontario.

Special map of region west of Mississippi river.

Special triangulation map of region west of Mississippi river.

Detailed topographical sheets of above region.

Specimen copies of photolithographic atlas,

Engineer, Ordnance Sections.

crayon topographical atlas, and geological atlas.

Models of Harbor Improvements.

Work at Hallet's Point, N. Y. (Hellgate.)
Northern extremity of Cape Cod.

Section of iron landing pier of Delaware breakwater harbor.

Iron ice barrier proposed for Horse Shoe of Delaware river.

Breakwater at Dunkirk, N. Y.

Crib and lighthouse on Spectacle reef, Lake Huron.

Angle crib and lighthouse at Harbor of Refuge, Lake Huron.

Model showing shore lines and breakwater at Harbor of Refuge, Lake Huron.

Crib and pier at Chicago, Illinois.

Crib work for piers on Lake Ontario.

"Mattress" or "apron" used in improvements of harbor at mouth of Cape Fear river, N. C.

Models of Machinery and Appliances.

Steam drilling scow.

Capstan-head and machinery for screwing down iron piles at Delaware breakwater landing pier.

Derrick for landing shafts.

Eccentric clamp or "nipper" for sustaining piles.

Snag boat, showing hull.

Dredge-boat "McAlester."

Large grapple.

Photographs.

Views of Hallet's Point, N. Y.; snag boat; Red river; cribs and piers at Chicago, Ill.; country west of Mississippi river (Wheeler expedition).

Materials, Specimens, and Samples.

Specimens of borings at site of landing pier of Delaware breakwater; of iron used in construction of landing pier; of timber piles taken from between tides at Reedy Island; ice barrier; of building stone, concrete, and woods, collected from various parts of the United States; of fossil trees; of large cypress stump, taken from mouth of Cape Fear river, N. C.

Miscellaneous.

United States bridge equipage, pontoon wagons, loaded; tool wagon; forge; model of bridge train, wagons, and loads; reserve and advance guard bridges; siege and mining tools; field photographic outfit; reconnaissance instruments; bridge model; models of torpedoes; models of apparatus for measuring subaqueous explosions, in glass tank; torpedoes, full size, models, 1874-75; ground mine; cable stop; junction boxes; torpedo cables, multiple and single; operating box; electrical apparatus used with torpedoes; iron plate from torpedo target, showing effects of thirty pounds of dynamite exploded under water at thirty feet distance; models of King, De Russy, and Hunt self-depressing gun carriages; models of mortar carriage and muzzle-pivoting gun carriage; surveying, astronomical, and barometrical instruments for field work; publications of the engineer bureau.

ORDNANCE SECTION.**Sea Coast Guns.**

20 in. Rodman gun, on carriage and chassis, with hydraulic buffer, on platform; implements.

12 in. Thompson b. l. rifle, experimental, under Laidley's gun lift.

9 in. Sutcliffe b. l. rifle, experimental, on carriage and chassis, with Sinclair's friction-brake, mounted on platform; implements.

10 in. Woodbridge gun, experimental; in slings, under Laidley sling cart.

8 in. m. l. converted rifle, experimental, on 10 in. casemate carriage and chassis, with pneumatic buffers, mounted on platform in model of casemate; implements.

Mann's 8 in. b. l. rifle; wrought iron, experimental, mounted on top carriage and chassis.

8 in. siege howitzer, mounted on wooden siege carriage.

Siege Guns.

4.5 in. siege rifle gun, mounted on Benton's experimental iron siege carriage, with limber; implements.

Field Guns.

Light 12 pdr. gun, 4.62 in. wooden carriage, with limber; implements.

Sutcliffe 3.9 in. b. l. rifle, experimental.

Hotchkiss 3.9 in. b. l. rifle, experimental.

Moffat 3.15 in. b. l. rifle, experimental.

Mann's 3 in. b. l. rifle, experimental.

3 in. wrought iron, m. l. rifle, mounted on Benton's experimental iron 12 pdr. field carriage, with limber and caisson; implements; model horse harnessed to limber, with mounted driver.

10 pdr. Parrot rifle, mounted on Watervliet arsenal experimental iron field carriage, with limber.

3 in. Whitworth field piece, on carriage.

2.5 in. Woodbridge gun, experimental; fired 1327 times.

Hotchkiss field cannon, experimental.

Rebel b. l. pieces, field and boat, experimental skids.

Lyman's multicharge rifle, cal. 6 in., experimental skids.

Bomford and Wade perforated gun, experimental; used to determine experimentally exterior lines of heavy cannon, by means of pressure at different points of bore.

Mountain howitzer, mounted on carriage.

Mountain howitzer battery, on stands.

Volley and Repeating Guns.

Gatling gun, short barrel, cal. 45, on cavalry carriage; model horse in harness.

Hotchkiss revolving cannon, on carriage, experimental.

Union repeating (coffee-mill) gun, on carriage, experimental.

Regua battery, on carriage, experimental.

Guthrie & Lee gun, on carriage, experimental.

Vandenburgh volley gun, on carriage, experimental.

Revolutionary Guns.

6 pdr. French guns, bronze, presented by Lafayette; forming enclosure around models of modern gun plant.

12 pdr. siege gun, bronze, mounted on wooden carriage, with limber.

8 in. howitzer, bronze, mercer.

24 pdr. howitzers, Byer's; cast in Philadelphia.

Anthony Wayne howitzers, intended to be used on horseback; cast in Germantown, Philadelphia, by D. King.

Mortars.

13 in. sea-coast mortars, on bed, with centres, pintles, chassis mounted, on platform; implements.

24 pdr. Coehorn mortars, on beds.

Carriages.


New cavalry forge cart.

Projectiles.

Shot, shells, grape, canister, etc., for various weapons and calibres; smooth-bored and rifled; fired and unfired; hand-grenades,

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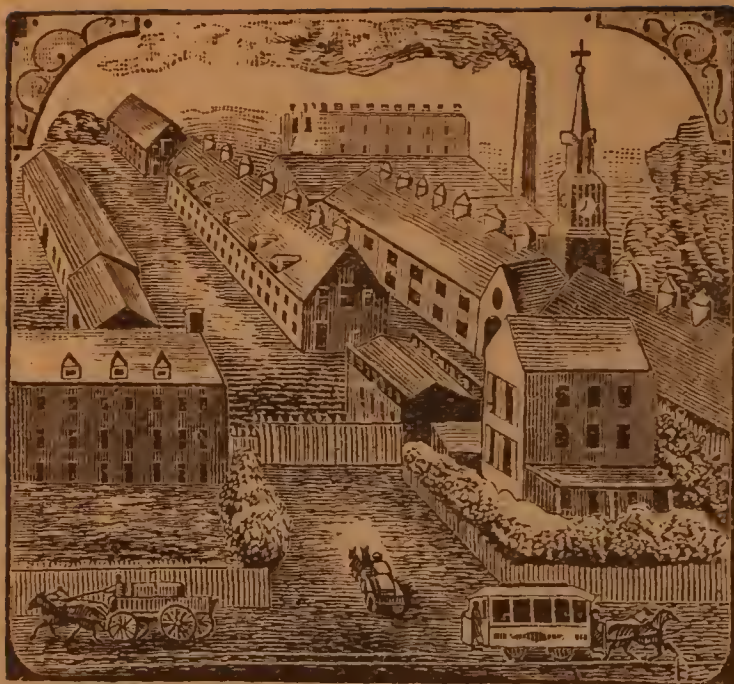
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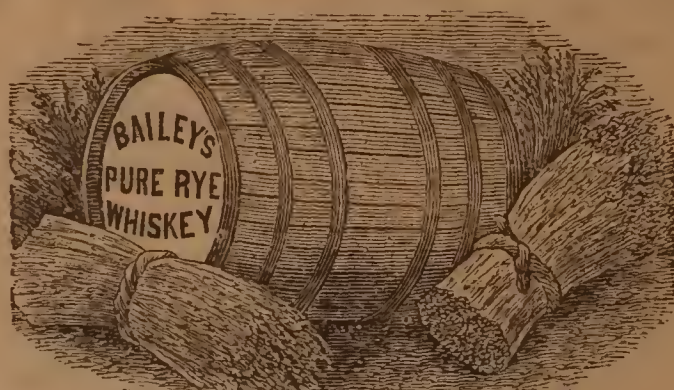
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bombs, rockets, torpedoes, etc. Experimental projectiles from West Point

Small Arms.

Historical collection of muzzle-loaders, wall-pieces, muskets, musketoon, rifle, pistol, flintlocks, percussion, breech-loaders, fixed and movable chambers, revolvers, tip-up barrels, needle guns, cylindered, magazine, chassepot, repeating, coffee-mill, drop-lever, slap-over guns, American and foreign.

Bayonets, blades, knives, swords and scabbards, lances, pikes, halberds, cleaning appliances, etc.

Accoutrement.

Sets of infantry, cavalry, and artillery equipments; cartridge boxes, canteens, metal work on scabbards, etc.; powder horns and flasks, cartridges, and cases of various materials and calibres; primers, locks, fuses; cartridge-making machinery.

Models.

Minute man.

Rifle private, full dress, Hall breech-loading rifle, 1818.

Private, mounted rifles, Mexican War, 1845.

Infantry private, 1858-1866, regulation equipment.

Cavalry private, 1865, Spencer, Mann's equipment.

Infantry man, full dress, 1876.

Infantry man, marching outfit, 1876.

Cavalry man, present, full dress, 1876.

Light-artillery man, full dress, 1876.

Horse, carved in wood, for cavalry equipment.

Horse, carton pierre, for artillery harness.

Horse, stuffed, for Gatling cart.

Rock Island Arsenal, Illinois, in photo-relief.

Hitchcock gun-plant, with gun in sections, with set test specimen Hitchcock gun material, showing tensile and torsional strength; sample forging-disk; Dank's iron bloom; Graff, Bennett, & Co., Hitchcock's gun materials; long turnings H.G. material; and thin turnings H.G. material.

Rodman gun-plant, with specimen, showing tensile compression and torsional strength of the American cast-iron used in Rodman gun.

Woodbridge gun, with set specimens, showing tensile strength of Woodbridge gun construction; reel-wire for Woodbridge gun; and half-ring, bronzed, Woodbridge gun.

Cast of bore in gutta-percha of 8 in. m. l. converted rifles, with centres for same on trestles.

Glass-case specimens, containing small models, relics, etc.

Tree, cut in two by musketry at the battle of the Wilderness, Va.

Boards of component parts of small arms, and progressive work on scabbards.

Rodman gun, mounted in barbette and in casemate

Mortar, mounted on bed with centre pintle chassis.

Table with models, field and siege carriages.

Lead-bullets, joined together by collision in mid-air at the battle of Petersburg, Va.

Machines.

Casemate gin; Baxter engines.

Cartridge Machinery.

Portable gas furnace for annealing cartridge shells; double-action press; drawing presses; case and cup anvil trimmers; header; primer; cup venting, and impression machines; bullet, ball-trimming, and greasing, tapering, and loading machines; cup anvil press; rotary fan; packing tables and work boxes.

Gun-making Machinery.

Drop hammer; forge; trimming jumper; barrel-boring lathe, for nut boring and quick boring; barrel-turning lathe; straightening stand, polishing stand; vises, with machine for bending swivels; trimming press; drill press; rifling, brush, and profiling machines; milling and screw machines; clamp milling machine; machine for bending swivels; grindstone; engine lathe; emery mill grinder; second drilling receiver; first turning stock; lock-bedding with post and spare pulley; air pump and reservoir; bench for assembling guns.

Instruments.

Laidley laboratory, showing principles of construction, and illustrating experiments in ballistics; models pressure; pendulum eprouvette; camera lucida for representation with model of Frankford target; Shultz chronoscope, with Russel's interrupter; vignotti machine; Le Boulangé chronograph; Benton thread, and electro-ballistic machines; target for electro-ballistic machines; recoil dynamometer; mercurial densimeter; scales for mercurial densimeter; stereometer; collection of inspecting instruments for cannon and projectiles for 3 in. rifle and 15 in. gun; iron tube for firing through with safety; firing stand.

Miscellaneous.

Boards showing rifle practice.

Publications from ordnance office and artillery school.

Medal, army target practice; stadia, silver (1 cavalry, 1 infantry); telemetres (1 battery, 1 infantry, and 1 field).

Corrugated iron powder barrels; copper powder barrel.

NAVY DEPARTMENT.

ORDNANCE BRANCH.

Rifled and Smooth Bore Guns.—15 in. guns on Eriksen's and Edes's steam carriages.

[These two guns are mounted on a circular platform and inclosed in a wooden turret, representing in size and form a monitor's iron turret.]

Pieces of heavy ordnance, muzzle and breech loading, of antiquated styles and manufacture.

Guns from 11 in. to 3 in. calibre, and 100 pdrs. to 12 pdrs., variously mounted.

Torpedoes.—Automatic, stationary, and movable; electric batteries, wires, fuses, etc.;

illustrating progress made by the torpedo school.

Small Arms.—Muskets, rifle and smooth bore, breech- and muzzle-loading; pistols, swords, cutlasses, bowie knives, battle axes, tomahawks, boarding helmets, etc.

Ordnance publications.

Samples of gunpowder.

Inspecting instruments for heavy guns; implements for gauging and inspecting shot and shell.

Fuse presses; machines for making percussion caps; metallic cartridges; solid head metallic musket and pistol cartridge now used in the navy, showing the different stages of

Navigation, Observatory, Docks, Engineering, Etc.

manufacture; other musket cartridges and cartridge inventions in possession of the navy.

Rifle projectiles for heavy guns; inventions of Dahlgren, Holroyd, Dana, Parrot, Hotchkiss, James, Brooks, and other inventors.

Sub-calibre and elongated projectiles for smooth bore guns; solid shot, shell, incendiary shell, grape, canister, shrapnel, as used at present, and as previously used or proposed.

Projectiles which have been fired at iron targets; models of projectiles; model gun-carriages; war rockets, hand grenades; leather work of navy ordnance; sponges, rammers, and scrapers of different styles and inventions; fuses, cannon primers, and caps, cannon locks, night signals, impressions from guns, vent impressions; gun sights; breech, reinforce, and trunnion.

Figures of sailors, showing the dress and arms at different periods.

Miscellaneous articles and naval relics.

NAVIGATION BRANCH.

Navy bunting and navy flags, illustrating the present state of the bunting manufacture in the United States, as shown in the bunting made for the navy and known as "navy bunting," and also the mode of making flags by dyeing in pattern.

Bunting testing machine.

Navy sounding machines and auxiliary apparatus, showing the improvements in Sir William Thomson's sounding machine, and the various devices for detaching sinkers, and bringing up specimens of bottom, water, etc.

Navy signal apparatus, showing the colored lights (Coston's), with specimens.

Navy compasses and compass-testing instruments, showing specimens of the navy compass, azimuth circle, tell-tale, boat, and monitor compasses.

Portable compass-testing instrument, with specimens to illustrate development of the liquid compass.

Specimens of the old dry or air compass of American makers, illustrating the progress of improvement.

Adjustable binnacle.

NAVAL OBSERVATORY.

Publications.

Photographs of astronomical and other objects.

Chronometers.

Objects illustrative of American Arctic explorations.

Buildings and instruments used in the observations of the transit of Venus, December 8, 9, 1874.

HYDROGRAPHIC OFFICE.

Nautical charts, books, etc., published by the Hydrographic Office.

NAUTICAL ALMANAC OFFICE.

Publications of the office.

YARDS AND DOCKS BRANCH.

Plans of navy yards at Portsmouth, N. H.; Boston, Mass.; New York, N. Y.; Washington, D. C.; Norfolk, Va.; Pensacola, Fla., and Mare Island, Cal.

Plans of machinery at Boston navy yard; plans of dry docks at Boston, Mass., and Norfolk, Va.

Photographs of buildings, etc., at Portsmouth, N. H.; New York, N. Y.; Norfolk,

Va.; League Island, Pa.; Boston, Mass., and Mare Island, Cal.

Models of dry docks at Boston, Mass.; New York, N. Y.; Norfolk, Va., and Mare Island, Cal.

Pyramid of blocks of wood taken from naval vessels.

STEAM ENGINEERING BRANCH.

Machinery of the "Nipsic."

The machinery of the various sizes of steam launches.

The engines of the "Epervier."

Part of the original machinery of the torpedo boat "Spuyten Duyvel," a steam launch, with the first torpedo machinery used in the United States Navy.

Detail drawings of compound engines.

Photographs of machine shops, foundries, etc., showing improved tools used in the manufacture and construction of steam machinery.

Two compound boilers.

Baird's distiller, illustrating the method of making fresh water on board ship at sea.

EQUIPMENT AND RECRUITING BRANCH.

Young's ship's galley, with utensils for cooking for 500 men.

Hemp, manila, and wire rope; cable, blocks, chain cables, etc.

CONSTRUCTION AND REPAIR BRANCH.

Models of the "Constitution," "Mississippi," "Jamestown," "St. Mary's," "Portsmouth," "Constellation," "Niagara," "Merrimac," "New Ironsides," "Hartford," "Monitor," "Kearsage," "Vandalia," "Constitution," "President," "Ohio," "Enterprise," "Washington," and "Fulton."

Full-rigged model.

MEDICAL AND SURGICAL BRANCH.

Medicines and Hospital Stores used in the Navy.

Surgical instruments and appliances usually supplied in the service; additional case of surgical instruments occasionally supplied in lieu of the standard operation case.

Cots and stretchers for transportation of wounded in action.

Model of a sick bay; the part of the ship usually allotted for hospital accommodation.

Model of hospital ship.

Fan for ventilating the hold of a ship in hot climates.

Starting funnel arrangement for aerating distilled water.

Set of record and account books for a naval hospital.

Fracture bedstead, for elevating the patient and changing position.

Bed with woven wire mattress.

Photographs and plans of naval hospitals.

PAY, PROVISION, AND CLOTHING BRANCH.

Articles and materials of clothing issued in the navy.

Package, showing the manner of packing clothing for sea.

Navy rations in glass jars, and packages of the same as prepared for sea.

"Small stores," articles for mess use: pans,

Patents, Pensions, Lands, Indians, Education, Census.

spoons, knives, etc., tobacco, soap, needles, thread, and other small articles.

Packages of tobacco and soap as packed for sea use.

Paymasters' books and blanks for a ship with complement of 200 men; paymasters' sta-

tionery; stewards' stores, scales, and tools used in issuing provisions.

Iron safe: locks used on paymasters' storerooms, three in number.

Specimen of candles.

TREASURY DEPARTMENT.

(Owing to want of sufficient appropriation by Congress for defraying the expense of the participation in the Exhibition by the Treasury Department, no definite arrangements have yet been made for contributions from it.—March 31, 1876.)

INTERIOR DEPARTMENT.

PATENT OFFICE.

Publications.—Annual reports; official gazette; indexes to patents, general and yearly; volumes of patents, monthly and weekly; decisions of Commissioner of Patents; mechanical dictionary; official classification.

Drawings of Models.—Selected series (60,000), intended to serve in the illustration of the Patent Office work, from the classes given below.

Models.—Selected series (5000), intended to serve in the illustration of the Patent Office work, from the following classes: agriculture; harvesters; mills and presses; architecture; civil engineering; railways; navigation; metallurgy; metal working; wood working; steam; hydraulics; pneumatics; mechanical movements; hoisting; horse powers; journals and bearings; vehicles; fire arms; textile; printing and stationery; stone; clay; glass; leather; light; heat; electricity; household; chemistry; gas; ice, and fine arts.

Miscellaneous Collections of Interest.—The original Declaration of Independence; Gen. Washington's commission from the Continental Congress; personal effects of Gen. Washington, such as furniture, porcelain, clothing, cane, sword, traveling escritoire, surveying compass, camp equipage, including tent, mess-kit, money-chest, etc.

Weapons of historical interest, such as bayonets from General Braddock's line of march; muskets presented by the Emperor of Morocco to Mr. Jefferson; war saddle of Baron De Kalb; sabres of honor presented to United States officers by sovereigns and beys; model of invention by President Lincoln.

PENSION OFFICE.

Publications.—Annual reports; graphic illustrations; wall maps; wall charts; portfolios of diagrams, etc.; collections of historical interest; selections from the archives of the office relative to the Revolutionary war.

GENERAL LAND OFFICE.

Publications.—Annual reports; digests, and other documents.

Graphic Illustrations.—Maps, charts, and atlas of surveys; miscellaneous collections; instruments and processes employed in the land survey.

INDIAN OFFICE.

Publications.—Reports and other publications.

Illustrations.—Portraits, photographs, maps of reservations, etc.

Models.—Wigwams, communal houses, canoes, etc.

Miscellaneous Collection of Interest.—Costumes, male and female, adult and others; weapons of war and the chase; tents, wigwams, canoes, etc.; domestic utensils; specimens of food; toys, games, and festivals; arts and manufactures of the tribes; ethnological collections, etc.

EDUCATION OFFICE.

Publications by the Office.—Annual and special reports, and circulars of information.

Publications by other Offices or Persons.—Foreign reports on American education; foreign educational reports and documents; treatises on pedagogy; and educational journals.

Graphic Representations.—Wall maps and charts; portfolios of engravings, drawings, and photographs; busts; paintings, and other portraits.

Models of Educational Buildings.—The primitive log school-house; country school-house of to-day; city graded school-house; college buildings; details as to dormitories, ventilative apparatus, school-rooms, etc.; models of adobe and sod school-houses.

Specimens of School Furniture, Apparatus, and text-books.—Historic collection, showing progress in text-books; specimens and models of school desks, seats, black boards, school maps, charts, etc.; specimens of modern slates, globes, natural history cabinets, chemical and philosophical apparatus, chemical appliances, etc.

Miscellaneous Collections of Interest.—Selected volumes of state and city educational reports; catalogues of private schools, academies, seminaries, colleges, and professional schools, selected series; catalogues and reports of orphan, reformatory, and charitable schools for the young, etc.; catalogues and reports of institutions for the deaf mute, blind, etc.; catalogues and reports of libraries; catalogues and reports of museums of art, of science, and of natural history.

These miscellaneous collections, some bound and others in their original condition, will be exhibited as showing specimens of the materials for the study of education, which are published by the systems and corporations themselves.

Volumes of manuscript returns made to the Bureau of Education by educators and school officials of every grade, and used in the preparation of its annual and special reports.

CENSUS OFFICE.

Publications.—Decennial censuses; statistical atlas, 1870.

Surveys, Post-Office, Agriculture.

Graphic Illustrations.—Maps, charts, and diagrams.

Miscellaneous Articles of Interest.—Original schedules of the census of 1790; selected volumes of schedules of subsequent censuses.

GEOLOGICAL AND GEOGRAPHICAL SURVEY OF THE TERRITORIES.**1st Division.**

Publications.—Reports, bulletins, etc.

Graphic Illustrations.—Topographical and geological atlases; wall maps and charts; panoramic photographs; stereoscopic views; photographic portfolios; photographic transparencies; paintings, landscapes, portraits, etc.

Models and Reliefs.—Topographical and geological relief maps; relief sections; models of displacement; models of ancient

ruined cliff habitations; models of same restored.

Collections of Interest.—Geological and mineralogical cabinets; pottery, costumes, weapons, implements, toys, etc.

2d Division.

Publications.—Reports; bulletins; monographs, etc.

Graphic Illustrations.—Topographical and geological atlases; wall maps and charts; panoramic and stereoscopic views; portfolios, albums, and transparent photographs.

Models and Reliefs.—Topographical and geological relief maps; geological structural sections; models of displacement.

Miscellaneous Collections.—Geological and mineralogical specimens arms, clothing, etc.

POST-OFFICE DEPARTMENT.

The exhibition of this Department is classed under the following general heads:

A MODEL WORKING POST-OFFICE.

This is a branch office or station of the Philadelphia office, and shows the practical workings of the following divisions of this Department, viz.: Box and general delivery system; system of carrier delivery and collections; registered letter system; money-order system; foreign mail system, etc.

RAILWAY MAIL SERVICE DIVISION.

Two railway post-offices or postal cars, equipped with mail-bag catchers, and all other first-class appointments of that service, under charge of railway post-office clerks, by whom the mailing and distribution of outgoing mails is performed. Several models of mail catchers are also exhibited under this head.

Model mail cars,—small size,—exhibiting the practical working of the mail-bag catcher upon a miniature truck inside the building.

STAMPS, STAMPED ENVELOPE, AND POSTAL CARD DIVISION.

Machine in operation manufacturing stamped envelopes; machine in operation manufacturing postal cards; specimens of all stamps, stamped envelopes, and postal cards; specimens of registered-letter envelopes and post-office official envelopes; specimens of all United States post-office stamps and stamped envelopes, formerly used and now out of date.

MAIL EQUIPMENT DIVISION.

Leather pouches for letter mails; canvas bags for printed and miscellaneous matter; also registered-letter mail bags; mail locks, now in use; mail locks, out of use.

TOPOGRAPHICAL DIVISION.

Railway and general postal-route maps, and money-order office maps.

DIVISION OF BOOKS AND BLANKS.

Specimens of all books, blanks, etc., used by the Department; letter scales; marking and rating stamps.

AGRICULTURAL DEPARTMENT.

The exhibit from the Agricultural Department embraces as follows:

BOTANICAL DIVISION.

A collection of all the timber trees of the United States, in sections, showing interior and exterior surfaces; specimens of flowers, leaves, and fruits; herbarium specimens of grasses and other specialties.

STATISTICAL DIVISION.

Large outline maps of the United States, showing forest areas, extent, and value of farming lands, and amount of production, by counties; arrangement of charts and diagrams detailing amount of special products, by sections; statistics of farm animals, and illustrated statistics of industrial education; statistical album of miscellaneous details, with charts, diagrams, etc.

ENTOMOLOGICAL DIVISION.

Collections of fruit and vegetable models; birds beneficial and injurious to farmers and

orchardists; poultry types, illustrated by stuffed specimens; collection of grains and cereals; collection of textile fibres of the United States, with specimens of their manufacture; specimens of tobacco, from different tobacco-producing sections of the United States; mounted collection of beneficial and injurious insects.

MICROSCOPICAL DIVISION.

Series of water-color drawings illustrating typical genera of microscopic fungi; preparations illustrating the characteristics of poisonous and edible mushrooms common to the United States; illustrations displaying the varied character of the starch granules of plants; drawings and illustrations explaining method of distinguishing vegetable and animal fibres, their kind and quality; drawings displaying vegetable and animal cellulose and starches, and illustrating methods of detecting them in organizations.

CHEMICAL DIVISION.

Fertilizers.—Mineral—including phos-

JOHN CLARK, JR. & CO.'S

MILE END, GLASGOW,

BEST

Six-cord Spool Cotton

ON BLACK SPOOLS,

IS UNRIVALLED

FOR

HAND AND MACHINE USE.

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HOMER BROOKE, *GLASS MOULD MAKER*

1876—17 years located at—

Formerly of the J. C. Glass Works.

White, cor. Centre St.,

NEW YORK.

Every description of Moulds for making Blown and Pressed Glass and for
Casting Lead, Zinc, etc., made to order.

PRESSES MADE TO ORDER. CHUCKS FOR OVAL TURNING

THE PRACTICAL MOULD MAKER.

*Inventor and Patentee of the Processes and Machinery used in making Screw Glass Insulators
for Telegraph poles, now in use throughout the United States and other countries.*

Patents Jan. 25th, 1870, May 26th, 1874, Aug. 25th, 1874.

WM. BROOKE, Established 1850.

H. BROOKE, Successor, 1863.

COLBORNE BROOKES, UNITED STATES, CANADIAN, and GENERAL *PATENT SOLICITOR,*

CIVIL AND MECHANICAL ENGINEER, AND EXPERT,

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BRANCHES IN ENGLAND, CANADA, FRANCE, BELGIUM, ETC., ETC.

Horticulture, Animals, Fish, Ethnology.

phates, apatite, coprolites, and all minerals and materials yielding potash, etc.; vegetable—muck, peat, sea-weed, and other products of vegetable decomposition; animal—including guanos, bones, refuse from abattoirs, fisheries, oil manufactures, cancerine, etc.; agricultural products and materials obtained by chemical processes from flour, meal, bran, hominy; methods of preserving, etc., with special products of manufacture, viz: starch, dextrine, sago, sugars, gums, glucose; products obtained by fermentation; wine, beer, ale, etc.; products of acetous fermentations;

tanning materials of the United States: barks, leaves; tanning solutions, with modes of manufacture; dyes of the United States; resins and products of distillation of resinous materials; oils, vegetable, fixed, and others; products of milk, classified according to methods of production.

HORTICULTURAL DIVISION.

Specimens of economic and utilizable plants, showing methods of growth, culture, etc., grapes, cotton, tobacco, flax, broom corn, jute, corn, sorghum, yucca fibres, etc.

SMITHSONIAN INSTITUTION, AND COMMISSION ON AMERICAN FOOD FISHES.

The Smithsonian Institution makes the following exhibits:

Publications of the Institution.

Smithsonian contributions to knowledge; miscellaneous collections; annual reports, and other publications.

Meteorological work of the Institution: Charts showing the mean temperature, rainfall, and barometric pressure of the United States.

International exchanges; statistics of number of correspondents; extent of distribution by exchange.

General condition; financial statement.

COLLECTION TO ILLUSTRATE THE ANIMAL RESOURCES OF THE UNITED STATES.

IN CHARGE OF G. BROWNE GOODE.

Animals' Beneficial or Injurious to Man—Mammals; birds; reptiles; amphibians; fishes; elasmobranchiates; marsipobranchiates; leptocardians; insects; arachnids; crustaceans; worms; mollusks; radiates; protozoans and marine products not of animal nature.

Means of Pursuit and Capture.—Hand-implements; implements for seizure of objects; missiles; baited hooks; angling tackle; nets, and traps.

Apparatus for Wholesale Destruction.—Hunting animals; decoys and disguises; pursuit—its methods and appliances.

Means of Utilization.—Preparation and preservation of foods; manufacture of textile fabrics, felts and stuffings; preparation of the skin and its appendages; the hard materials; oils, glues, drugs, perfumes, chemical products, fertilizers and lime; preservation of the animal for scientific uses.

Animal Products and their Applications.—Food; clothing; materials employed in the arts and manufactures.

Protection and Culture of Useful Animals.—Investigation; protection, and propagation.

COLLECTION TO ILLUSTRATE THE FISHERY RESOURCES OF THE UNITED STATES.

This is covered to a considerable extent by the preceding group, in connection with which it is arranged. The special features will embrace the following:

Fishing vessels, boats, etc., life size and models.

The apparatus and dories used in the whale fisheries.

Nets, traps, and pounds.

Hooks, lines, baits, etc.

Cast, photographs, and drawings of fish and other aquatic animals.

Prepared or living specimens of aquatic animals.

Products of the waters.

Economical applications of the above products.

E.—COLLECTION TO ILLUSTRATE THE ETHNOLOGY OF THE UNITED STATES.

IN CHARGE OF DR. CHARLES RAW.

(This exhibition is made conjointly with the Indian Bureau of the Interior Department.)

Objects of Stone.

Flaked and chipped stone; raw material (pieces of flint, etc.); flakes and cores of flint, obsidian, etc.; rude or unfinished implements; arrow and spear heads; perforators and scrapers; cutting and sawing implements; dagger-shaped implements; leaf-shaped implements; digging implements, and wedge or celt-shaped implements.

Peked, ground, and polished stone; wedges or celts; chisels; gouges; adzes; grooved axes; hammers; ceremonial weapons; cutting tools; scraper and spade-like implements; pendants and sinkers; discordal stones, etc.; pierced tablets and boat-shaped objects; grinding and polishing stones; stone vessels; mortars; pestles; tubes; pipes; ornaments, and sculptures.

Objects of Copper.

Implements and ornaments.

Objects of Bone.

Implements, weapons, and ornaments.

Objects of Shell.

Utensils, implements, and ornaments.

Objects of Clay.

Mound pottery and terra cottas.

Objects of Wood.

Fragmentary objects and carvings of an early date.

Ethnological Series.

Man.—Skulls, mummies, etc.

Culture.—Aliments, food (mineral and vegetable), drinks, narcotics, and medicines.

Habitations.—Models of houses, tents, etc., and appurtenances.

Furniture.—Cradle boards, mats, etc.

Vessels and other utensils of household use.—Earthenware; carved horn and wooden ware; stone ware; wicker work; bladders and boxes.

Utensils for smoking, etc.—Pipes; tobacco pouches; snuff apparatus, etc.

Receptacles used as means of transportation.—Pouches, bags, raw-hide cases, burden-nets, etc.

Ethnology, Minerals.

Clothing.—Raw material; complete suits; head, body, hand, leg, and foot clothing; parts of dress.

Personal adornment.—Skin ornamentation; head, neck, breast, body, and limb ornaments; toilet articles.

Implements of general use of war and the chase, and of special crafts.—Implements for cutting, drilling, etc.; lances, bows and arrows, clubs, tomahawks, etc.; shields, body armor, etc.; implements for fire-making, arrow-making, pottery, for procuring and manufacturing food; agricultural implements; implements used in spinning, weaving, sewing, and embroidery.

Means of locomotion and transportation.—Snow shoes, ice creepers, etc.; balsas, dug-outs, bark canoes, hide boats, etc.; saddles, bridles, halters, harness, etc.; sleighs, etc.

Games and pastimes.—Gambling implements; masks, etc., used in dancing; rackets, balls, etc.; toys.

Music.—Drums, rattles, whistles, flutes, etc.

Art.—Pictorial representations and carvings.

Superstition.—Charms, mythological figures, etc.

COLLECTION TO ILLUSTRATE THE MINERAL RESOURCES OF THE UNITED STATES.

IN CHARGE OF W. P. BLAKE.

The principal objects of this collection of the useful ores and minerals of the country have been to illustrate: 1st. The nature and variety of the mineral resources of the United States; 2d. The geographical distribution and geological associations of the minerals; 3d. The extent to which they have been utilized; 4th. The mechanical, metallurgical, and chemical processes by which they are extracted or converted into useful products; 5th. The inherent and comparative qualities of the extractive products. A portion of the collection is arranged according to the nature of the objects, irrespective of locality, but the bulk of the Exhibition is grouped geographically by States. There is also a section devoted to models and drawings, and one to geological maps and graphic charts. This collection occupies the northeast portion of the Government Building, upon the right of the main aisle.

I. SYSTEMATIC SERIES, GROUPED IRRESPECTIVE OF LOCALITY, IN THE FOLLOWING ORDER:

- a* Crystalline minerals, chiefly for scientific and educational purposes.
- b* Fuels and petroleum.
- c* Ores, metals, and their immediate derivatives.
- d* Ornamental stones and gems.
- e* Building stones; marbles, etc.
- f* Artificial stones; lime; mortars; cement.
- g* Fictile materials and direct products, including refractory materials, etc.
- h* Pigments; colors; detergents.
- i* Grinding, abrading, and polishing substances.
- k* Fertilizing substances.
- l* Sulphur, salts, and minerals chiefly used in chemical manufactures.

II. ORES, MINERALS, AND METALLURGICAL PRODUCTS, GROUPED BY STATES.

Maine.—Iron ores, limestone and pig iron; granite for buildings and monuments.

New Hampshire.—Granitic and metamorphosed rocks; granite; geological map of the State.

Vermont.—Marble; slate of various colors; roofing slate, etc.; iron ores and limonite; chilling pig iron; spiegeleisen; kaolin and fire brick; sand for glass making; copper ores, copper, and metallurgical products; scythe stones.

Massachusetts.—Iron ore, siderite; magnetic iron ore, and steel produced from it; iron and steel wire; emery, massive and associate; corundum, corundophyllite, diaspore, red oxide of titanium, and ilmenite; argenterous lead ore, galenite; copper ore; syenite and porphyry; porphyry, a series of polished specimens; granite; sand for glass making; glass, cut and pressed; pearl ash and red lead; kaolin; potters' clay, brick clay, etc.; potters', paper, and alum clay; marble and limestone; geological map of the State.

Rhode Island.—Granite, for building and monumental purposes; magnetite; anthracite and graphitic coal, in large mass and in lumps.

Connecticut.—Granite and building stone; marble and limestone; serpentine marble, verd antique; barytes (sulphate of barytes); kaolin, brick clay, and products; iron ores, limonite, etc.; pig iron; iron ore, spathic and associates; cement steel; mining picks and hammers; copper and alloys, nickel silver, etc.; feldspar, siliceous, etc., for pottery purposes; geological map of the State.

New York.—Magnetic iron ores, building stones, etc.; fluxes, fuels, and iron; Bessemer steel; hematite, magnetite, etc.; malleable cast iron; puddled iron and muck bar; limestone and lime; hydraulic limestone, hydraulic cement, and cement drain-pipe; kaolin, crude and washed; "incombustible mineral wool," or nitrous fibre "slag felting;" lead and tin foil; fire clay and fire clay goods, refractory materials, etc.

New Jersey.—Magnetic iron ores; iron ore; massive and granular willemite; zinc ores and franklinite; zinc; spiegel iron, "franklinite iron;" calamine (silicate of zinc); potters' and brick clay and iron-stone china ware; refractory furnace materials, fire brick, etc.; fire-brick clay and fire brick, etc.

Pennsylvania.—Iron ore, flux, and fuel; coal and coke; kaolin; limestone; iron ores, limonite, specular iron, etc.; copper ores; copper and copper products; petroleum and petroleum products; glass, and materials for its manufacture; window glass and materials; pig iron and ores; nickel and cobalt ores and products; cast steel; sheet iron; chromite.

Maryland.—Iron ore, flux, and fuel.

Virginia.—Zinc ores, calamine; lead ores, galena, cerussite, etc.; gypsum; barytes; kaolin; iron ores, magnetite, hematite, limonite, and fossil ore; coal and coke; copper ores; salt brine, fossil salt, and prepared salt; gold-bearing quartz; manganese; granite.

West Virginia.—Bituminous coal; coke; iron ores, black band, brown hematite, and fossil ores.

North Carolina.—Gold and silver ores; copper ores; marble; corundum and the associate minerals; iron ores and iron; muscovite (mica); geological map of North Carolina.

South Carolina.—Phosphatic fossils, mineral fertilizers, etc.; minerals and ores.

Alabama.—Ores and coal; spiegeleisen and ores; geological map of Alabama.

Minerals, Geological Maps and Publications.

Tennessee.—Iron ores, coal and mineral products; copper pyrites and vein stone; refined copper; geological map of Tennessee.

Georgia.—Auriferous gravel; gold-bearing quartz, etc.

Kentucky.—A series of specimens illustrating the mineral resources of the State.

Louisiana.—Rock salt; sulphur.

Ohio.—Open hearth steel; iron ores, flux and fuel; pig iron; potters' clay and pottery; crude and manufactured plaster; building stone.

Indiana.—Specimens of block coal, and iron ores; potters' clay; "Indianite."

Missouri.—Lead ores, galena, cerussite, etc.; pig lead; zinc ores; barytes, associated with lead ores; marble, limestone, and granite; iron ores, magnetite, specular iron, hematite; pig iron; copper ore; coal and coke; fossil plants, etc.; porphyry.

Michigan.—Iron ores, flux, and Bessemer pig iron; specular and magnetic; native copper, crystallized; mass and stamp work, with silver and associate minerals, and in amygdaloid and "ash bed;" building stone;

native silver; copper and "copper conglomerate."

Colorado.—Gold and silver ores; gold, and ores containing tellurium; silver and copper ore.

Utah.—Silver ores.

Idaho.—Gold and silver ores.

Montana.—Silver ores; argentiferous galena.

Arizona.—Copper ores; gold quartz, and other minerals.

Nevada.—Silver and gold ores.

California.—Gold and silver ores; auriferous gravel, "cement" with gold; quicksilver ores, cinnabar and native quicksilver; copper ores; tin ores and tin.

III. MODELS AND DRAWINGS.

IV. GEOLOGICAL MAPS AND GRAPHIC CHARTS.

Geological Map of the United States and Territories.

Geological and other Maps of the State of New Hampshire.

Geological Reports and Publications.

WOMEN'S PAVILION.

Scale, 80 ft. to 1 in.



BELMONT AVENUE.

A Offices.

B School-house.

Total Length, 208 ft. Width, 208 ft. Height of Nave, 41 ft. Height of Dome, 67 ft.



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If you wish to know what progress America has made in
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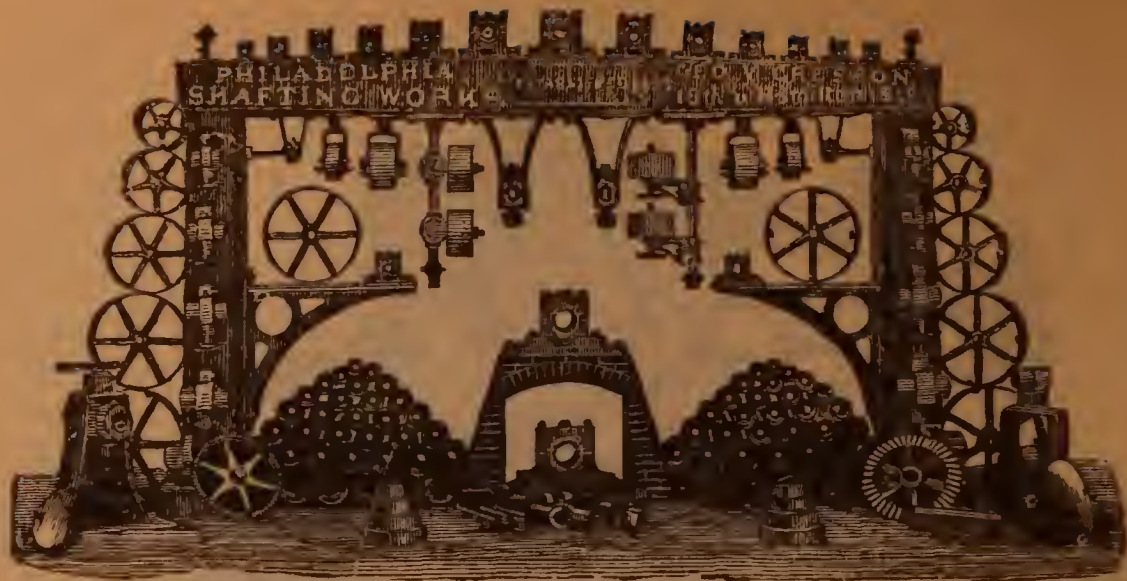
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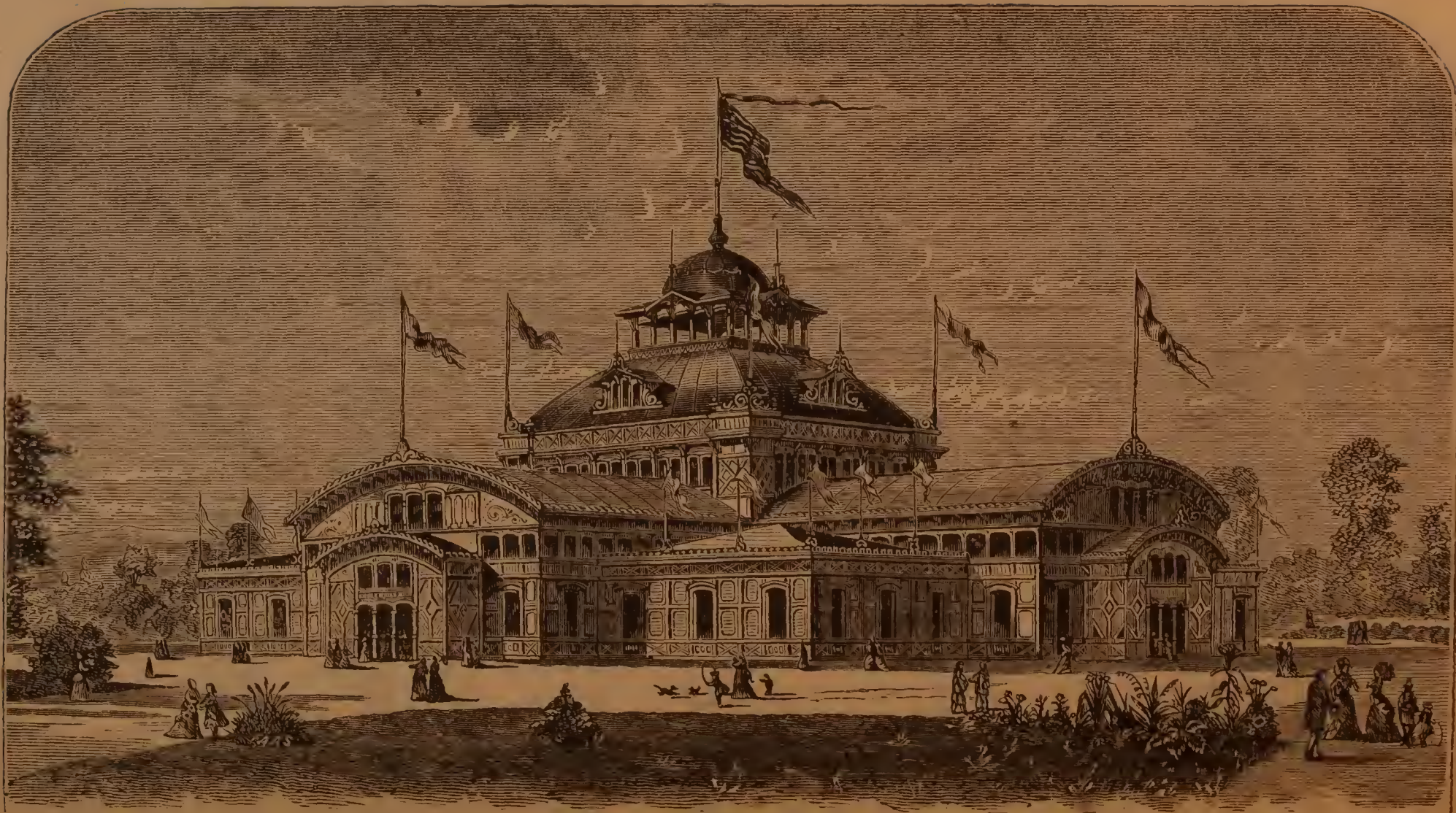
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EVERY APPURTENANCE USED IN TRANSMISSION OF STEAM POWER.

Special attention is called to the Driving Pulleys with Internal Clamp Hub which gives a perfect fit on the Shaft, without Forcing Machine or Sledge Hammer.

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PHILADELPHIA, PA.



WOMEN'S PAVILION.

WOMEN'S PAVILION. No. 161.

Architect, H. J. SCHWARZMANN.—Size, 26,368 square feet.

THIS pavilion was erected by money raised through the exertions of the women of the United States, and is devoted exclusively to the results of women's labor. It is built of wood, and is situated on Belmont avenue, adjacent to the Horticultural grounds.

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Furniture, Household Implements, Clothing, Needle Work.

Ceramics—Pottery, Porcelain, Glass, etc.

- 1 Hoopes, Ellen C., Soho Pottery, Pittsburg, Pa.—Iron stone china toilet set. Sec. B. 210

Furniture and Objects of General Use in Construction and in Dwellings.

- 2 Stiles, Mrs. E. W., Philadelphia, Pa.—Combination desk and book paper file. Sec. D. 217
- 3 Chapman, Miss Laura M., Friendship, N. Y.—Lap table. Sec. D. 217
- 4 Spofford, Mrs. Jennie H., Philadelphia, Pa.—Mattress supporter, mosquito bar. Sec. D. 217
- 5 Parker, Mrs. Margaret E., Dundee, Scotland.—Artistic screen. Sec. A. 217
- 6 James, Mary I., Cambridge, Mass.—Holly wood chess table. Sec. A. 217
- 7 Page, Mrs. Elizabeth M., Philadelphia, Pa.—Dirt catcher. Sec. D. 217
- 8 Steele, Mrs. M. W., Woodbury, N. J.—Toy set, quill furniture. Sec. B. 217
- 9 Dickerson, Mrs. Y. G., Belfast, Maine.—Embroidered camp chair, foot rest, and sofa pillow. Sec. D. 217
- 10 Mountain, Mrs. H. B., New York City.—Life-preserving mattress. Sec. D. 217
- 11 French, Julie Blanche, Boston, Mass.—Bedsteads containing drawers, interior safe, etc. Sec. D. 217
- 12 Davey, Mrs. Israel, Brandon, Vt.—Slate stand tops and panels. Sec. A. 217
- 13 Mitchell, Mrs. Carrie, Normal, Ill.—Combined bureau, table, cupboard, and sink. Sec. D. 217
- 14 Ladies' Centennial Committee of Worcester, Mass.—Sec. A.
 a Painted screen. 217
 b Picture frame. 220
- 15 Bulfinch, Miss Susan E., Cambridge, Mass.—Book rack, with pen and ink etchings. Sec. A. 220
- 16 Sherwood, Amanda S., Philadelphia, Pa.—Griddle greaser. Sec. D. 224
- 17 Fox, Jane Ann, Stamford, N. Y.—Dish drainer. Sec. D. 224
- 18 Whitman, Mrs. E. J., Oakland, Cal.—Kettle and pan scraper. Sec. D. 224
- 19 Tremper, Miss Marietta, New York, N. Y.—Window-washing machine. Sec. D. 225
- 20 Colvin, Margaret P., Battle Creek, Mich.—Rotary washing machine. Sec. D. 225
- 21 Bancroft, Sarah H., Media, Pa.—Bathing chair. Sec. D. 226

Woven and Felted Goods of Wool, etc.

- 22 Shapleigh, Mrs. E. B., Philadelphia, Pa.—Hand-made rug. Sec. D. 239

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 23 Drury, Mrs. L., Springfield, Ohio.—Dress cutting system. Sec. D. 250
- 24 Brooks, C. S., Philadelphia, Pa.—System for cutting clothing. Sec. D. 250

- 25 Union Benevolent Society, Philadelphia, Pa.—Infants' clothing. Sec. D. 250

- 26 Jones, Mrs. M. A., Philadelphia, Pa.—Children's clothing, dress cutting system. Sec. D. 250

- 27 Tardy, Mrs. C., Paterson, N. J.—Infants' exercising corset. Sec. D. 250

- 28 Brosse, Madame S. C., San Francisco, Cal.—Models for self-measurement. Sec. D. 250

- 29 Keyser, Mrs. E., Philadelphia, Pa.—Misses' clothing and infants' outfits. Sec. D. 250

- 30 Harman, Mrs. E. F., New York, N. Y.—Dress and pattern designer. Sec. D. 250

- 31 Cornwell, Mrs. Elmira, Philadelphia, Pa.—Self-fitting chart, and patterns for cutting ladies' and children's clothing. Sec. D. 250

- 32 Overend, Rebecca C., Fairlee, Md.—Tippet and muff from pod of wild cotton. Sec. B. 250

- 33 Livingston, L. M., New York.—Garment cutting, tailors' system. Sec. D. 250

- 34 Flynt, Mrs. Olivia P., Boston, Mass.—Weather protector, linen duster, skirts, and under garments. Sec. D. 250

- 35 Stearns, Mrs. A. B., Woburn, Mass.—Diagrams for cutting clothing. Sec. D. 250

- 36 Greene, Miss, London, England.—Needle work. Sec. D. 250

- 37 Bonney, Sarah E., Sterling, Mass.—Sec. B.
 a Muff, boa, and cap. 250
 b Feather fans. 254

- 38 Palmer, Miss H. M., London, England.—Point lace parasol cover. Sec. C. 252

- 39 Hubbard, Miss Lucy, England.—Pillow lace. Sec. A. 252

- 40 Hudson, Mrs. A., Buckingham, England.—Point lace. Sec. C. 252

- 41 Harding, Miss Caroline, Norfolk, England.—Embroideries. Sec. D. 252

- 42 Emanuel, Miss Lizzie E., Philadelphia, Pa.—Embroidered shawl. Sec. D. 252

- 43 Ladies' Centennial Committee, Worcester, Mass.—Needle work. Sec. D. 252

- 44 States, Mrs. E. J., Boston, Mass.—Embroideries and infants' dresses. Sec. D. 252

- 45 Bravo, Miss Sofia, St. Augustine, Fla.—Pincushion cover and Spanish needle work. Sec. B. 252

- 46 King, Mrs. Henry, Georgetown, D.C.—Embroidered cashmere shawl. Sec. D. 252

- 47 Paget, Miss Nina, London, England.—Needle work. Sec. D. 252

- 48 Weiller, Julia, Philadelphia, Pa.—Embroidered picture. Sec. D. 252

- 49 Noot, L., New York, N. Y.—Hand-made laces. Sec. C. 252

- 50 Whitesides, Mrs. E. G., Philadelphia, Pa.—Braiding and embroidery. Sec. D. 252

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Needle Work, Ornaments, Educational Work, Art.

- 51 McCarthy, Miss Eva, Washington, D. C.—Piano cover. Sec. D. 252
- 52 American Button Hole, Overseaming, and Sewing Machine Co., Philadelphia, Pa.—Sewing machine work. Sec. D. 252
- 53 Anthony, Mrs. Sarah E., Smyrna, Del.—Embroidered picture. Sec. D. 252
- 54 Smyth, Mrs. M. H., Philadelphia, Pa.—Embroidery and lace mending. Sec. D. 252
- 55 Auerbach, Mrs. Annie T., Troy, Ala.—Embroidered white satin spread. Sec. D. 252
- 56 Drury, Mrs. L., Springfield, Ohio.—Lace shawl. Sec. D. 252
- 57 Stansbury, Mrs. J. C., Jersey City, N. J.—Thread lace. Sec. D. 252
- 58 Shepherd, Mrs. E. M., Northampton, Mass.—Embroidery and lace. Sec. D. 252
- 59 Heubel, Miss Melanie, Philadelphia, Pa.—Embroidered picture. Sec. D. 252
- 60 Parker, Mrs. M. E., Dundee, Scotland.—Lace shawls. Sec. C. 252
- 61 Huston, Mrs. A. B., Cincinnati, Ohio.—Embroidered motto. Sec. A. 252
- 62 Davey, Mrs. Israel, Brandon, Vt.—Sec. A. 253
 a Jewelry. 253
 b Paper weights. 254
- 63 Pierce, Mrs. Mary R., Philadelphia, Pa.—Thread and needle bank. Sec. C. 254
- 64 Requa, Emma M., New York, N. Y.—Miniature Independence Bell. Sec. B. 254
- 65 Baem, Mrs. L. C., Boston, Mass.—Decorated lamp shades. Sec. B. 254
- 66 Jenkins, Mrs. R. E., Bordentown, N. J.—Dolls' shoes. Sec. B. 254
- 67 Martin, Mrs. J. H., Philadelphia, Pa.—Feather flowers. Sec. B. 254
- 68 Harley, Elizabeth G., Haddonfield, N. J.—Complete darning. Sec. D. 254
- 69 Yohe, Mrs. Daniel, Philadelphia, Pa.—Lamp mat. Sec. D. 254
- 70 Schmitt, Madam Katherine, Philadelphia, Pa.—Hair jewelry. Sec. B. 254
- 71 Whitman, Mrs. E. J., Oakland, Cal.—Buttons that require no needle or thread. Sec. D. 254
- 72 Tremper, Miss Marietta, New York City.—Shawl strap and bag combination. Sec. D. 255

Paper, Blank Books, and Stationery.

- 73 Stiles, Mrs. E. W., Philadelphia, Pa.—Revolving ink stand. Sec. D. 258
- 74 McNair, Linda H., Oakland, Cal.—Book marker, pencil holder, and paper cutter combined. Sec. D. 258

Medicine, Surgery, Prothesis.

- 75 Marshall, Clara, Women's Medical College of Pennsylvania.—Materia medica cabinet and pharmaceutical preparations. Sec. C. 272
- 76 Treadwell, Mrs. F. C., Philadelphia, Pa.—Dental work. Sec. B. 277

- 77 Ramborger, Annie D., Philadelphia, Pa.—Dental work. Sec. B. 277

Hardware, Edge Tools, Cutlery, and Metallic Products.

- 78 School of Design, Cincinnati, Ohio.—Original metal work: hinges, lock plates, handle plates, etc. Sec. A. 284

Carriages, Vehicles, and Accessories.

- 79 Spofford, Mrs. Jennie H., Philadelphia, Pa.—Spring saddle. Sec. D. 296
- 80 Ruth, Mrs. Sarah, Philadelphia, Pa.—Sunshade for horses. Sec. D. 296
- 81 Jones, Mrs. D. S., Washington, D. C.—Carriage afghan. Sec. D. 296

Educational Systems, Methods, and Libraries.

- 82 Woman's Art School, Cooper Union, New York, N. Y.—Normal School Work. Sec. A. 302
- 83 Hale, Sarah Josepha, Philadelphia, Pa.—Books. Sec. C. 306
- 84 Fields, Mrs. Jas. T., Boston, Mass.—Books by Massachusetts women. Sec. C. 306
- 85 Stone, Lucy, Boston, Mass.—Books. Sec. C. 306
- 86 Brotherson, Mrs. H. B. M., Peoria, Ill.—A poem. Sec. C. 306

Institutions and Organizations.

- 87 Richards, Margaret C., Philadelphia, Pa.—Work of Indian women. Sec. C. 312
- 88 Janvier, Mary R., Northam, India.—Curiosities from India. Sec. B. 312

Scientific and Philosophical Instruments and Methods.

- 89 French, Elizabeth J., Philadelphia, Pa.—Electro-magnetic appliances. Sec. D. 325

Sculpture.

- 90 Freeman, Miss Florence, Rome, Italy.—Sec. A. 400
 a Marble bust. 400
 b Sculptured chimney piece. 401
- 91 Hosmer, Miss Harriet S., Rome, Italy.—Sec. A. 400
 a The African Sibyl. 400
 b Lord Brownlow's Gates. 401

Collective Exhibit of Carved Work, Painting, etc., from Ladies of the Cincinnati School of Design, Cincinnati, Ohio. (Sec. A.)

- 92 McLaughlin, Miss M. Louise.—Bust, female head, "The pleasing thought." 400
- 93 Banks, Miss Fannie M.—Carved Estey organ. 405
- 94 Pitman, Miss Agnes.—Carved Piano. 405
- 95 Pitman, Mrs. and Miss.—Carved oak door, ebony inlaid and black walnut door. 405
- 96 Johnson, Misses Hattie and Mary.—Carved black walnut bedstead, ebony inlaid. 405

Wood Carvings, Oil Paintings.

- 97 Huston, Mrs. A. B.—Carved dining-room mantel. 405
- 98 Pitman, Mrs. and Miss.—Carved dining-room shelves. 405
- 99 Barrett, Mrs. T. M.—Carved cabinet. 405
- 100 Pitman, Mrs. Agnes.—Carved hanging cabinet, ebony inlaid. 405
- 101 Tidball, Miss Flora.—Child's carved bedstead. 405
- 102 Pitman, Miss Agnes.—Carved chest of drawers, and mantel bracket, ebony inlaid. 405
- 103 Pack, Miss Mary L.—Carved oak secretary cabinet. 405
- 104 White, Mrs. A.—Carved dressing bureau. 405
- 105 Caldwell, Miss Hattie D.—Carved altar cross. 405
- 106 Johnson, Misses Hattie and Mary.—Carved hanging cabinet and picture frame. 405
- 107 Cooper, Miss Alice.—Carved *prie dieu* and stool. 405
- 108 Jordan, Miss Laura B.—Carved mahogany hanging cabinet. 405
- 109 Abbott, Mrs. E. F.—Carved dressing stand. 405
- 110 Rice, Miss Julia H.—Carved parlor table. 405
- 111 Laws, Miss Lizzie T.—Carved gothic flower stand. 405
- 112 Gurley, Miss Clara.—Carved writing desk. 405
- 113 Collard, Miss Helen.—Carved ebony prayer book covers. 405
- 114 Johnson, Misses Hattie and Mary.—Carved wall pocket. 405
- 115 Hirst, Miss Claude R.—Carved parlor easel and jewel casket. 405
- 116 Banks, Miss Fanny M.—Carved flower stand. 405
- 117 De Pilgrom, Miss V.—Carved black walnut bedstead. 405
- 118 Barrett, Mrs. S. M.—Carved chess table and picture frame. 405
- 119 Pitman, Miss Agnes.—Carved hanging secretary, walnut and ebony. 405
- 120 White, Mrs. A.—Carved picture frame. 405
- 121 Collard, Miss Isora.—Carved book racks and casket. 405
- 122 Johnson, Misses Hattie and Mary.—Carved photograph frames. 405
- 123 McDowell, Miss W. H.—Carved gothic stand. 405
- 124 Huston, Mrs. A. B.—Carved dog kennel frame. 405
- 125 Dominick, Mrs. G.—Carved cherry wall pocket and casket. 405
- 126 Tidball, Miss Flora J.—Carved flower stand. 405
- 127 Collard, Miss Helen.—Carved picture frame. 405
- 128 Vallandingham, Miss N.—Gentleman's carved dressing stand. 405
- 129 Collier, Miss Lizzie M.—Carved tea pot rest. 405
- 130 Hesser, Mrs. C. F.—Carved flower stand. 405
- 131 Huston, Mrs. A. B.—Carved bread plate. 405
- 132 Stern, Miss Jessie.—Carved wall pocket and card receiver. 405
- 133 Donnelly, Miss A.—Carved flower stand and picture frame. 405
- 134 Drake, Miss Ada P.—Carved jardinière. 405
- 135 Swift, Miss Mary P.—Carved writing desk. 405
- 136 McCloskey, Miss Lizzie.—Carved wall pocket and photograph frame. 405
- 137 Collard, Miss Helen.—Carved trencher, picture frame, and flower stand. 405
- 138 Pitman, Miss Agnes.—Carved fruit plate and card receiver, library stool, lamp stand, and picture frame. 405
- 139 Dunlap, Miss Sarah.—Carved wall pocket. 405
- 140 Hollingshead, Miss H.—Carved casket and picture frame. 405
- 141 Kidd, Mrs. N. R.—Carved flower stand. 405
- 142 Metcalf, Miss Flora.—Carved shield. 405
- 143 Newell, Miss Emma.—Carved fruit plate. 405
- 144 Caldwell, Miss Hattie D.—Carved picture frame. 405
- 145 Dodd, Mrs. William.—Carved casket. 405
- 146 Rice, Miss M.—Carved picture frame. 405
- 147 Menzies, Miss R. N.—Carved corner bracket. 405
- 148 Brashear, Miss Lillie.—Carved parlor easel. 405
- 149 Scudder, Miss Tillie.—Carved medicine cupboard. 405
- 150 Doherty, Miss Clara.—Carved fruit plate. 405
- 151 Tazzer, Miss Augusta.—Carved rocking chair. 405
- 152 Moore, Miss A. G.—Carved flower stand. 405
- 153 Kemper, Mrs. Theodore.—Carved tray. 405
- 154 Shaler, Miss Minnie.—Carved chess board and picture frame. 405
- 155 Merrill, Miss Susie.—Carved flower stand and carved and painted bracket. 405
- 156 Temple, Mrs. O. H.—Carved picture frame and wall bracket. 405
- 157 Brashear, Miss Lillie.—Carved flower stand. 405
- 158 Stribley, Miss May.—Carved picture frame and casket. 405
- 159 Tatum, Miss Lizzie.—Carved flower stand. 405
- 160 Huston, Mrs. A. B.—Painted slate panels. 410
- 161 Barrett, Mrs. S. M.—Silver bronze panels and oil painting. 410
- 162 Hirst, Miss Claude R.—Oil painting. 410
- 163 Drake, Miss Ada P.—Painted tiles. 410

Wood Carvings, Paintings, Drawings, Engravings.

- 164 Dominick, Mrs. G.—Illumination and medallion lettering. 411
- 165 Ladies' Centennial Committee, Worcester, Mass.—Wood carvings. Sec. A. 415
- 166 Force, Mrs. F. H., Cincinnati, Ohio.—Carved black walnut corner cabinet. Sec. A. 415
- 167 Dodd, Mrs. Wm., Cincinnati, Ohio.—Carved boudoir table and parlor easel. Sec. A. 415
- 168 Williams, Mrs. E., Cincinnati, Ohio.—Child's carved mahogany bedstead. Sec. A. 415
- 169 McLaughlin, Miss M. Louise, Cincinnati, Ohio.—Carved hanging cabinet, walnut and ebony, and jardiniere. Sec. A. 415
- 170 Cincinnati School of Design for Women, Cincinnati, Ohio.—Carved and inlaid black walnut and ebony furniture, mantel piece, grand piano and organ. Sec. A. 415

Painting.

- 171 Walker, Miss W. Augusta, Rome, Italy.—Oil paintings. Sec. A. 410
- 172 Way, Agnes C., Pittsburg, Pa.—Oil painting. Sec. A. 410
- 173 Preble, Miss Mary, London, England.—Oil paintings. Sec. A. 410
- 174 Sartain, Emily, Philadelphia, Pa.—Oil paintings. Sec. A. 410
- 175 Penniman, Miss Ellen A., Rome, Italy.—Oil painting. Sec. A. 410
- 176 Linderman, Mrs. Sophia, Philadelphia, Pa.—Oil paintings. Sec. A. 410
- 177 Ferguson, Mrs. Mary L., Philadelphia, Pa.—Oil paintings. Sec. A. 410
- 178 Natt, Phebe Davis, Philadelphia, Pa.—Oil painting. Sec. A. 410
- 179 Gordon, Margaret S. G., Philadelphia, Pa.—Water color paintings. Sec. A. 410
- 180 Callier, Alice, Salem, Mass.—Painted panel. Sec. A. 410
- 181 Tancyhill, Flora, Alliance, Ohio.—Oil painting. Sec. A. 410
- 182 Gilbert, Lucia M., Pittsford, Vt.—Oil painting on slate. Sec. A. 410
- 183 McLaughlin, Miss M. Louise, Cincinnati, Ohio.—Painted slate panels. Sec. A. 410
- 184 Clark, Sarah A., Rome, Italy.—Sec. A. 411
a Oil painting. 410
b "The Dante Album." 411
- 185 McLaughlin, Miss M. Louise, Cincinnati, Ohio.—Sec. A. 410
a Painted panels. 410
b Painted plates, cups, teapot, stands, etc. 413
- 183 Wilkinson, Miss G., London, England.—Water color drawings. Sec. A. 411
- 187 Klippart, Josephine, Columbus, Ohio.—Water color painting. Sec. A. 411
- 188 Conolly, Miss J. L., Rome, Italy.—Illuminations. Sec. A. 411
- 189 Frere, Miss, England.—Water color drawings, painted fan. Sec. A. 411
- 190 Wratislaw, Miss Matilda, Rome, Italy.—Water color, female head. Sec. A. 411

- 191 Ladies' Centennial Committee, Worcester, Mass.—Paintings. Sec. A. 411
- 192 Blakemore, Mrs. J. W., Philadelphia, Pa.—Water color painting. Sec. A. 411
- 193 James, Mary I., Cambridge, Mass.—Painting on porcelain. Sec. A. 413
- 194 Homans, Miss S. E., Boston, Mass.—Painted porcelain. Sec. A. 413
- 195 McLaughlin, Miss M. Louise, Cincinnati, Ohio.—Decorated egg cups, original design. Sec. A. 413
- 196 Meredith, Mrs. L. P., Cincinnati, Ohio.—Decorated plates, flowers. Sec. A. 413
- 197 Wood, Miss Martha J., Pittsford, Vt.—Sec. A. 410
a Oil paintings. 410
b Painting on enameled slate. 413

Engraving and Lithography.

- 198 Mitchell, Mrs. Nellie D., Philadelphia, Pa.—Pastel painting. Sec. A. 420
- 199 Hopkins, Florence J., Washington, D. C.—Ferns in ink. Sec. C. 420
- 200 James, Mary I., Cambridge, Mass.—Pen and ink etchings. Sec. A. 420
- 201 West, Elizabeth J., Philadelphia, Pa.—Marking with indelible ink. Sec. D. 420
- 202 Hubbard, Mabel G., Cambridge, Mass.—Charcoal sketch. Sec. A. 420
- 203 Bell, Mrs., Philadelphia, Pa.—Colored crayons. Sec. A. 420
- 204 Landis, Mrs. D. C., Philadelphia, Pa.—Pastel painting. Sec. A. 420
- 205 Earls, Rebecca H. C., Philadelphia, Pa.—Crayon pictures. Sec. A. 420
- 206 Phillips, E. B., Philadelphia, Pa.—Marking in indelible ink. Sec. D. 420
- 207 Smyth, Mrs. M. H., Philadelphia, Pa.—Indelible ink marking. Sec. D. 420
- 208 Torrey, Martha A., Philadelphia, Pa.—Indelible ink marking. Sec. D. 420
- 209 Woman's Art School, Cooper Union, New York, N. Y.—Sec. A. 420
a Drawings from casts, photo-crayons. 420
b Work of engraving by pupils. 422
- 210 Wormley, Mrs. Annie E., Columbus, Ohio.—Microscopic illustrations on steel. Sec. A. 421
- 211 Sartain, Emily, Philadelphia, Pa.—Steel engravings. Sec. A. 421

Industrial and Architectural Designs, Models, and Decorations.

- 212 Tremper, Miss Marietta, New York, N. Y.—Design for stair carpet. Sec. D. 440

Ceramic Decorations, Mosaics, etc.

- 213 Whitney, Annie H., & Alice G. Chandler, Lancaster, Mass.—Carved wooden fireplaces with painted tiles, pottery and china on the shelves, and paintings above. Sec. A. 454

Objects of Art, Fancy Articles, Needle Work.

- 214 Macdaniel, Miss Fanny L., New York, N. Y.—"Illustrated Hymn" in pressed flowers, frame of pressed flowers. Sec. A. 454
- 215 Brothers, Mrs. H., Cincinnati, Ohio.—Wax flowers and materials for making them. Sec. B. 454
- 216 Jeremias, Triny, Philadelphia, Pa.—Tissue-paper flowers. Sec. B. 454
- 217 Dickeson, Anna Mary, Philadelphia, Pa.—Shell work. Sec. B. 454
- 218 Holcomb, Sallie N., Philadelphia, Pa.—Hair work. Sec. B. 454
- 219 Bickerton, Mrs. Anna B., Philadelphia, Pa.—Preserved and wax flowers. Sec. B. 454
- 220 McPherrren, Hattie E., Millersville, Pa.—Wax cross. Sec. B. 454
- 221 Kampmann, Mrs. Louise, Philadelphia, Pa.—Hair work. Sec. B. 454
- 222 Goodwin, Alice H., Hartford, Conn.—Climbing ferns and autumn leaves. Sec. C. 454
- 223 Springer, Mrs. L. R., Boston, Mass.—Wax work, preserved flowers. Sec. B. 454
- 224 Heubel, Miss Melanie, Philadelphia, Pa.—Wax work. Sec. C. 454
- 225 Whittington, Fannie L., New York, N. Y.—Basket of wax flowers. Sec. B. 454
- 226 Wilson, Mrs. Henry C., Philadelphia, Pa.—Phantom bouquet. Sec. B. 454
- 227 Martin, Mrs. Edna, Cambridge, Mass.—Oil painting on porcelain and wood panel. Sec. A. 454
- 228 Judkins, Miss Eliza M., Cambridge, Mass.—Paintings on mica. Sec. A. 454
- Machines used in Sewing, etc.**
- 229 Townsend, Mrs. G. L., Philadelphia, Pa.—Vertical handle attachment to sewing machines. Sec. D. 531
- Land Animals.**
- 230 Bonney, Sarah E., Sterling, Mass.—Stuffed birds. Sec. B. 635
- 231 Janvier, Mrs. Mary R., Sabathu, India.—Lammergeir, or bearded vulture. Sec. B. 635
- Hothouses, Conservatories, Graperies.**
- 232 Lovejoy, Mrs. Carrie P., Columbus, Ohio.—Preserved fern leaves. Sec. C. 709
- 233 Ware, Mrs. M. L., Philadelphia, Pa.—Preserved flowers. Sec. B. 709
- 234 Davey, Mrs. Israel, Brandon, Vt.—Trailing arbutus, poppies, leaves, etc. Sec. A. 709
- 235 Watson, Jane, Massillon, Ohio.—North American mosses. Sec. C. 712
- Garden Tools, Accessories of Gardening.**
- 236 Pierce, Mrs. Mary R., Philadelphia, Pa.—Flower stands. Sec. C. 721
- 237 Williams, Mrs. Jeff., St. Josephs, Missouri.—Terra-cotta hanging basket. Sec. C. 721
- 238 Slocum, Mrs. Martha E., New York.—Plant protector. Sec. D. 721

SWEDEN.

Furniture and Objects of General Use in Construction and Dwellings.

- 239 Rappe, Eugenie, Baroness, Skäl-snäs, Tjureda.—Pasteboard frames. 220

Clothing, Jewelry, and Ornaments, Traveling Equipments.

- 240 Soderberg, Maria, Stockholm.—Mantle. 250
- 241 Andersdotter, Margreta, Lällarp, Torscuna.—Embroidery. 252
- 242 Bagge, Charlotte, Kramfors, Hemösaad.—Embroidery and frames. 252
- 243 Ehrenpohl, Charlotte, Enslöf, Halmslad.—Embroideries. 252
- 244 Fürst, Batty, Upsala.—Needle-work. 252
- 245 Pählman, S., Ulexio.—Embroidery. 252
- 246 Segebader, Herminia, Trimethon.—Embroideries. 252
- 247 Jönsfon, Helena, Stockholm.—Fancy articles, ornamented with moss. 254
- 248 Klinghammar, Tersa, Landskrona.—Flowers and ornaments made from fish scales. 254

Paper, Blank Books, and Stationery.

- 249 Ehrenpohl, Charlotte, Enslöf, Halmslad.—Inkstand of burned clay. 258

Sculpture.

- 250 Bianchini, Emerentia, Stockholm.—Carvings in cork. 405

Painting.

- 251 Andersson, Amanda, Stockholm.—Oil paintings. 410
- 252 Ehrenpohl, Charlotte, Enslöf, Halmslad.—Oil painting. 410
- 253 Ramsay, Ebba, Tobsborg.—Water color painting of flowers. 411

Ornamental Trees, Shrubs, and Flowers.

- 254 Ramsay, Ebba, Tobsborg.—Herbarium. 7-9

NETHERLANDS.

- 255 Diest, E. van, Arnhem.—Silk bed cover, with mosaic work on border. 252
- 256 Loke, Mrs. C.—Footstool, cushion, and embroidered kerchief. 252
- 257 Suermoudt, Mrs., Amersfoort.—Embroidered cover and counterpanes. 252
- 258 Oldenborgh, Mrs. M. J., Dordrecht.—Imitation tiger skin and wax roses. 254
- 259 Amersfoordt, Mrs. H. M., Badhoeve.—Oratorio—"God's Ubiquity." 302

FRANCE.

- 260 Talhouet, Roy, Mrs., Paris.—Silk embroideries. 252
- 261 Menon, Mrs. Marie, Directress of the Levallois-Perret School for Drawing and Painting, Paris.—Pupils' work. 300
- 262 Chateau de Villiers Young Ladies' Institute, Paris.—Pupils' work. 300

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EXHIBITION PRIZES.

Only Medal, ... London, 1851.

Only First Class Medal, Paris, 1855.

Prize Medal, ... London, 1862.

Gold Medal, ... Paris, 1867.

Only Diploma of Honor, Vienna, 1873.

WAGON AND CARRIAGE BUILDING. No. 5.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 346 feet by 231 feet.

An annex to the Main Building, situated opposite to it on the Avenue of the Republic. It is built of wood, one story in height.

CENTENNIAL NATIONAL BANK. No. 6.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 72 feet by 40 feet.

E. A. ROLLINS, President.

Situated at the northwest corner of the Main Exhibition Building, and east of the Centennial Commission Office. It is one story high, built of wood, and is the medium for transacting the financial affairs of the Exhibition.

SWEDISH SCHOOL HOUSE. No. 8.

Architects, ISÆUS & JACOBSSON.—Size, 40 feet by 50 feet.

Situated in the Swedish Government grounds, north of the Main Exhibition Building. A one story frame house, containing school rooms and the interior arrangements of a Swedish school house. The framework for the building was imported from Sweden, and is on exhibition by G. O. Wengstion, of Stockholm.

THE PENNSYLVANIA EDUCATIONAL HALL. No. 9.

Architects, PETERS & BURGER.—Size, 148 feet by 100 feet.

The object of this Hall is the exhibition of the educational interests of the State of Pennsylvania. It is situated north of the Art Gallery, fronting on the Lansdowne drive. The building is octagonal in shape, and contains thirty-two alcoves for the display, a large assembly room, and a reception room. The following summary represents the exhibits:

1 Representations of kindergarten, primary, grammar, and high schools, with their appropriate furniture, fittings, text-books, apparatus, and work.

Systems of graded schools, with views and models of buildings, charts of statistics, specimens of apparatus, and volumes of scholars' work.

Schools of counties, with county and township maps of school-houses, photographs of buildings, charts of statistics, and scholars' work; plans of school buildings, with systems of heating, lighting, and ventilating, and designs.

Department of Public Instruction charts, showing statistics and outline of public school system, reports, forms, certificates, and laws.

Text-books, school furniture and merchandise, school apparatus and philosophical apparatus; school ornamentation, consisting of a fountain, a series of Rogers' groups, vases, hanging baskets, statues, engravings, etc. 300

2 Academies and Seminaries, with pictures of buildings, specimens of apparatus, cabinet collections, drawings, and paintings.

Universities and colleges, with pictures of buildings, maps of grounds, views of in-

terior rooms, charts of history and statistics, courses of study, text-books, and productions of professors and alumni.

Technical schools and departments, with drawings, casts, models of bridges, specimens of apparatus, etc. 301

3 Normal Schools.—Views of buildings and grounds, models, courses and methods of study, catalogues and reports, charts of statistics, and students' work.

Schools of Design.—Drawings, models, etc.

Commercial Schools.—Specimens of penmanship, etc. 302

4 Institution for the Blind.—Apparatus for teaching, intellectual and industrial work done by the blind.

Institution for the Deaf and Dumb.—Apparatus and methods of teaching. 303

5 Orphan Schools.—Views of buildings, scholars' intellectual and industrial work, books of record, forms and charts.

School for the Feeble-minded.—Text-books, apparatus, methods, etc. 346

6 Sunday-Schools.—Collections of Sunday-school material, incentives, maps, charts, forms, and models. 348

SINGER SEWING MACHINE BUILDING. No. 10.

Architect, JAMES VAN DYKE, Elizabeth.—Size, 81 feet by 56 feet.

SINGER MANUFACTURING CO., New York City.

Contains an exhibit of every style of machine manufactured by the Singer Manufacturing Company, and samples of work. It is constructed of wood, and is located on Lansdowne drive, north of the Art Gallery.

FRENCH RESTAURANT, LAFAYETTE. No. 11.

Architect, H. J. SCHWARZMANN.—Size, 130 feet by 30 feet.

PAUL SUDREAU, Philadelphia.

This is a two story wooden building, located northwest of the Art Gallery, between Lansdowne drive and the brook. It is conducted on the French plan.

HUNTER'S CAMP. No. 12.

"FOREST AND STREAM" PUBLISHING CO., N. Y., WM. C. HARRIS, Manager.

This camp illustrates sportsmen's life in the backwoods, and contains what is known as a permanent camp, built of logs and bark, with all the appurtenances of hunting and fishing, including portable boats, sporting firearms, rods and fishing tackle ready for use, portable cooking apparatus, specimens of game birds, a kennel of sporting dogs, etc., etc. An additional feature will be a lake or pond stocked with game fish, and a running stream containing brook trout. It is located in the ravine south of Horticultural Hall.

THE DAIRY ASSOCIATION BUILDING. No. 13.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 76 feet by 25 feet; pavilion, 80 feet by 30 feet.

Situated on the north side of Lansdowne Valley, southwest of Horticultural Hall. It is a two story rustic building, and the surrounding grounds are laid out as a garden in which is a pavilion for the additional accommodation of visitors.

PENNSYLVANIA BIBLE SOCIETY PAVILION. No. 14.

Architect, I. C. SIDNEY.—Size, 17 feet by 23 feet.

Located near Lansdowne Valley, south of Horticultural Hall, close to the Bridge; oval in shape, and surmounted by a carved roof with a projecting cornice. It bears the inscription, "The Bible without note or comment." In front is an open Bible, and over it the text from Jeremiah xxii. 29: "O earth, earth, earth, hear the word of the Lord." Only Bibles and Testaments will be sold.

PHILADELPHIA PAVILION. No. 16.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 88 feet by 66 feet.

For the accommodation of the municipal government of the City of Philadelphia. It contains a hall and parlors, and a room devoted to the use of the Park Commission. It is a one story frame building, situated on Lansdowne drive east of Horticultural Hall.

GERMAN EMPIRE PAVILION. No. 19.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 83 feet by 33 feet.

Constructed of stone, one story high, furnishing accommodations for the Imperial Commissioners as well as German visitors. It is located on Lansdowne drive, between Belmont and Agricultural Avenues.

BRAZILIAN GOVERNMENT BUILDING. No. 20.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 56 feet by 70 feet.

Situated on Agricultural Avenue between Fountain Avenue and Lansdowne drive; two stories high, built of wood, and surmounted by a cupola. It contains reception rooms and offices for the Commissioners and visitors from the empire of Brazil.

PHILADELPHIA "TIMES" PAVILION. No. 23.

Architects, WILSON BROS. & Co., Philadelphia.—Size, 28 feet by 17 feet.

A. K. McCLURE, Editor.

The Centennial business office of the "Times," a daily paper, issued morning and

evening, and printed on a Hoe perfecting press in Machinery Hall. It is a one-story frame building, located on Belmont Avenue, opposite and east of the Lake.

GLASS MAGAZINE. No. 24.

Architect, H. J. SCHWARZMANN.—Size, 40 feet by 40 feet.

KLAUTSHECK, THOMAS, & STUART, Philadelphia.

This magazine is erected adjoining the Photographic Association Building, opposite the Lake. It is constructed mainly of glass from the factories of the above firm, and contains a full assortment of plate and window glass, and glass shades for the accommodation of exhibitors; is two stories high, and is connected by a bridge with Belmont Avenue.

CIGAR PAVILIONS. Nos. 25, 36, 103, 108, 165, 166.

Architect, HENRY A. MACOMB.—Size, 70 feet square.

W. A. FLEMING & CO.

These pavilions, six in number, are located in different parts of the grounds. They are frame buildings, one story high, with observatories.

AMERICAN FUSEE COMPANY'S BUILDING. No. 26.

Size, 14 feet by 14 feet.

W. R. DAVENPORT, New York.

Situated on Lansdowne drive, north of the Judges' Building.

CENTENNIAL PHOTOGRAPHIC ASSOCIATION BUILDING.

No. 27.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 150 feet by 30 feet.

The Photographic Association have erected a one-story frame building, located north of the Main Exhibition Building on the east side of Belmont Avenue. It contains one room for the exhibition of photographs, and three rooms for photographers for working purposes.

PENNSYLVANIA RAILROAD OFFICE. No. 28.

Architect, J. M. WILSON, Engineer of Bridges and Buildings, Pennsylvania Railroad Co.—Octagon, 75 feet in diameter.

A two-story frame building, situated on the northeast corner of Belmont Avenue and the Avenue of the Republic, adjoining the Judges' Hall. It is designed for the general ticket office of the four great trunk lines, viz.: N. Y. Central, Erie, Baltimore and Ohio, and Pennsylvania Railroads. Tickets are sold to all points, and information is furnished regarding routes of travel.

MEDICAL DEPARTMENT. No. 29.

Architect, H. J. SCHWARZMANN.—Size, 65 feet by 32 feet 6 inches.

This department is instituted for the immediate gratuitous relief of accidents and sudden cases of illness occurring within the Exhibition grounds. It is located in Lansdowne ravine, equidistant from the Main Building and Horticultural Hall, and will contain two wards of three beds each, for male and female patients. An ambulance is provided for the removal of patients to their homes or to city hospitals.

Officers.

WILLIAM PEPPER, M.D., Medical Director.

THEODORE HERBERTE, M.D., Secretary and Resident Physician.

JACOB ROBERTS, M.D., Member of Staff.

S. W. GROSS, M.D., Member of Staff.

H. C. WOOD, M.D., Member of Staff.

R. G. CURTIN, M.D., Member of Staff.

HAMILTON OSGOOD, M.D., Member of Staff.

DE FORREST WILLARD, M.D., Member of Staff.

JUDGES' HALL. No. 30.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 152 feet by 113 feet.

A two-story frame building, situated north of the Main Exhibition Building, containing ten committee rooms and four private rooms for the judges; also one large hall in the centre, and a smaller hall in the rear. It is intended for the accommodation of the international jury.

TELEGRAPHIC BUILDING. No. 31.

Architects, BALDERSTON & HUTTON, Philadelphia.—Size, 80 feet by 75 feet.

DEPARTMENT OF PUBLIC COMFORT COMPANY, Limited.

W. MARSH KASSON, Chairman, Philadelphia.

The reception room of the Public Comfort Building opens from the east into the telegraphic department, which furnishes communication with every portion of the world. Is a one-story frame building opposite the northwest corner of the Main Exhibition Building, fronting the Esplanade. All of the instruments and appliances of the latest design are on exhibition and in use.

1 Philips, Wm. J., Philadelphia, Pa.—Printing telegraph instrument, combining the bell, dial, and printing telegraph in one instrument.

2 Phillips, Eugene F., Providence, R. I.—Covered wire for telegraphic purposes.

3 Gray, Elisha, Chicago, Ill.—Electro-harmonic telegraph, including apparatus for transmitting tunes and eight or more messages simultaneously.

4 Atlantic and Pacific Telegraph Co., Philadelphia, Pa.—Automatic and duplex telegraph apparatus.

5 Gray & Barton, Western Electric Telegraph Co., Chicago, Ill.—Printing telegraph instrument, with unison attachment.

6 Frost & Hanline, Philadelphia, Pa.—Automatic thermostat for fire-alarm telegraph.

7 Brooks, David, Philadelphia, Pa.—Underground cables for telegraph wires.

8 Gamewell, J. N., & Co., New York, N. Y.—American fire-alarm telegraph, with non-interference repeaters and signal-boxes, and mechanical gong apparatus.

9 American District Telegraph Co., Philadelphia, Pa.—District telegraph signal-boxes, with self-starting registers for messengers, guides, and interpreters.

JAPANESE DWELLING—A HOTEL. No. 33.

Architect, MATSUO-EHE, Tokio.—Size, 80 feet by 15 feet, and two wings each 21 feet by 15 feet.

Erected by a joint-stock company as a hotel and restaurant for the convenience of Japanese visitors. The wood of which it is constructed, as well also as the nails and tiles, were imported from Japan. The odor arising from the wood is regarded as a peculiar feature. It was built entirely by native workmen sent hither by the Japanese Government, and is situated in the neighborhood of the British Buildings, north of Machinery Hall.

DEPARTMENT OF PUBLIC COMFORT. No. 35.

Architects, BALDERSTON & HUTTON, Philadelphia.—Size, 264 feet by 112 feet.

DEPARTMENT OF PUBLIC COMFORT COMPANY, Limited.

W. MARSH KASSON, Chairman, Philadelphia.

Located on the corner of the Avenue of the Republic and Agricultural Avenue, opposite the northwestern corner of the Main Exhibition Building, and fronting the Esplanade. It is a two-story frame building, containing a reception room and ladies' parlor, free to all; barber shop; coat and baggage room; lunch counter and lavatories. Tickets for places of amusement are on sale, and a daily register of all visitors is kept. The western section of the building is occupied by the President of

THE SUN NEWSPAPER

Is printed and published every day in the year, at 166, 168, and 170 Nassau Street, New York City. Its regular edition on secular days now (April, 1876) averages about 140,000; its weekly edition over 88,000; and its Sunday issue is nearly 100,000. It thus prints and sells more than a million copies a week, which are read all over the United States. This is a circulation unprecedented in American journalism, and it is constantly on the increase. In proof of this, let the following figures testify. They show the number of copies of THE SUN printed every week during the year ending March 11, 1876.

WEEK ENDING	COPIES PRINTED.	WEEK ENDING	COPIES PRINTED.
March 20.....	849,382	September 18.....	860,358
27.....	845,802	25.....	858,778
April 3.....	857,956	October 2.....	863,935
10.....	863,556	9.....	870,820
17.....	855,076	16.....	878,082
24.....	858,270	23.....	874,625
May 1.....	869,542	30.....	876,160
8.....	867,550	November 6.....	908,580
15.....	877,450	13.....	852,372
22.....	874,946	20.....	847,815
29.....	866,276	27.....	836,248
June 5.....	873,782	December 4.....	845,378
12.....	869,769	11.....	1,042,716
19.....	880,348	18.....	956,294
26.....	883,846	25.....	933,864
July 3.....	898,862	January 1.....	933,987
10.....	867,574	8.....	952,202
17.....	877,400	15.....	953,019
24.....	876,282	22.....	969,911
31.....	874,216	29.....	967,850
August 7.....	865,558	February 5.....	993,030
14.....	875,982	12.....	1,024,647
21.....	880,488	19.....	1,027,209
28.....	870,502	26.....	1,014,766
September 4.....	872,211	March 4.....	1,014,993
11.....	860,755	11.....	1,028,951
TOTAL.....		46,799,769	

In printing these papers, no less than three million four hundred and twenty-six thousand six hundred and ten (3,426,610) pounds of paper were consumed.

ADVERTISING RATES.

DAILY AND SUNDAY, 40 cents a line, ordinary advertising; large type, 80 cents; and preferred positions, 50 cents to \$2.50, according to classification.

WEEKLY, 50 cents a line; no extra charge for large type. Preferred positions, from 75 cents to \$2.00.

SUBSCRIPTION RATES.

DAILY (4 pages), by mail, 55c. a month, or \$6.50 a year, postpaid; with Sunday edition, \$7.70.

SUNDAY (8 pages), \$1.20 per year, postpaid.

WEEKLY (8 pages), \$1.20 per year, postpaid.

Address,

THE SUN,
New York.

THE
American Newspaper Union.

A. J. AIKENS, President.

New York Newspaper Union, 148 and 150 Worth St., New York.	}	315 Newspapers, \$3.00 per line, per week.			
Chicago Newspaper Union, 114 Monroe St., Chicago.		350	"	\$3.50	" "
Milwaukee Newspaper Union, 365 East Water St., Milwaukee.		120	"	\$1.25	" "
Aikens Newspaper Union, 143 Race St., Cincinnati.		200	"	\$2.00	" "
Southern Newspaper Union, 227 Second St., Memphis, Tenn.		145	"	\$1.50	" "
St. Paul Newspaper Union, 17 Wabashaw St., St. Paul, Minn.		73	"	\$.75	" "

THE ORIGIN OF CO-OPERATIVE NEWSPAPER ADVERTISING.

Co-operative newspaper printing, as now practised, originated in Wisconsin twelve years ago. It is termed *co-operative* for the reason that one side of each of the newspapers is printed at a central office, and the paper sent in its half-printed state to the home office, where it is completed with editorials, local news, and other matter prepared by the editor or publisher. In December, 1846, the idea of co-operation, *with advertisements*, occurred to Mr. Aikens, while yet serving his time as an apprentice, in printing the message of President Polk on one side of a country newspaper of New England at Boston, and the other half being printed at the local office.

Mr. A. J. Aikens, a practical printer and business man, conceived the idea of reducing the cost of ready-printed paper, as it is now termed, to country publishers, by making an agreement with them to use a certain space in each of their papers for advertisements that he might procure. This plan of co-operation he put into practice twelve years ago, at the office of Cramer, Aikens & Cramer, Milwaukee. It at once became successful, leading to the establishment of co-operative newspaper printing-offices in Chicago, New York, St. Louis, Cincinnati, Memphis, St. Paul, and other places. There are now over two thousand newspapers printed upon the co-operative plan in the United States and Canadas, and the number is constantly increasing, it having more than doubled in the last five years. The enterprise is no longer an experiment, but an established success, and the system is one yielding manifold advantages to advertisers as well as to local publishers.

The American Newspaper Union

Is essentially national. The papers represented in it are located in all the States of the Union and in nearly five hundred county seats. They circulate over the whole area of the country from Maine to Colorado, distributing at least *one hundred copies every year to each square mile of the settled portions of the United States.*

Although, as a whole, the Union List is national, covering all sections, it is so made up of different members as to be susceptible of easy division into sections—East, Middle, West, South. The distribution of the papers is as follows:

New England	78	Illinois	117	Nebraska	15
New York	101	Michigan	86	Missouri	17
New Jersey	27	Wisconsin	98	Georgia	10
Pennsylvania	65	Tennessee	29	Alabama	32
Virginia	24	Kentucky	29	Louisiana	11
No. and So. Carolina . .	24	Minnesota	79	Mississippi	29
Ohio	122	Iowa	85	Other States	46
Indiana	81				

AGGREGATE CIRCULATION.

The circulation of these papers is large and constantly increasing. It is larger than the circulation of any other lists or combinations of country papers in the United States—the last aggregate weekly circulation being *seven hundred thousand seven hundred and thirty copies* (700,730).

SEND TO EITHER OFFICE FOR A CIRCULAR.

the Centennial Commission. Office desk room is afforded to exhibitors. The centre portion of the building is surmounted with an open-air gallery, giving a view of the grounds.

STAND PIPE FOR WATER-WORKS. No. 37.

Architect, FREDERICK GRAFF, Philadelphia.—Height, 133 feet.

J. MILLER, Brooklyn, N. Y.

Used for distributing through the Centennial grounds the water from the works on the river bank. It is constructed of wrought iron, and through it the water is carried to the height of 208 feet above the Fairmount dam. A 16-inch main conveys the supply to different localities.

FRENCH GOVERNMENT PAVILION. No. 38.

Architect, DE DARTEIN, France.—Size, 100 feet by 50 feet.

DEPARTMENT OF PUBLIC WORKS, France.

Is constructed of brick and iron, and exhibits models in relief and designs of all the public works of France executed during the last few years; also a collection of books and publications relative thereto. It is situated west of the Art Gallery, on Lansdowne drive.

VIENNA BAKERY, OR COMPRESSED YEAST BUILDING.

No. 40.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 146 feet by 105 feet.

GAFF, FLEISCHMANN, & CO., Blissville, Long Island, N. Y.

Designed to exhibit the advantages of using compound yeast in baking. It also contains a coffee house.

BANKERS' EXHIBIT. No. 41.

Architect, JAMES H. WINDRIM, Philadelphia.—Size, 69 feet by 41 feet.

Erected by the banks, bank officers, and bankers of the country for the exhibition of coins and currency. It is located east of the Art Gallery, and between the Photographic Gallery and the Vienna Bakery.

EMPIRE TRANSPORTATION COMPANY'S BUILDING. No. 42.

Architects, WILSON BROS. & CO., Philadelphia.—Size, 70 feet by 60 feet.

EMPIRE TRANSPORTATION CO., Philadelphia.

This structure is located north of the eastern end of the Main Exhibition Building, and exhibits by models the method of transportation used by the Empire Transportation Company and its auxiliaries in the United States.

CENTENNIAL FIRE PATROL. No. 43.

Architect, H. J. SCHWARZMANN.—Size: 1. 60 feet by 58 feet. 2. 84 feet by 74 feet.

The Fire Patrol is accommodated in two buildings, built of wood, one story high, containing halls for the engines, stalls for the horses, and dormitories for the firemen. The smaller house is at the northeast corner of the Main Exhibition Building, and the larger at the intersection of Lansdowne drive and Belmont Avenue. They are supplied with steam fire engines, hose trucks, ladders, and patent fire extinguishers.

PORTUGUESE GOVERNMENT BUILDING. No. 44.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 55 feet by 51 feet.

A one story wooden structure, with cupola, located on the northeast corner of Agricultural Avenue and Lansdowne drive, and used to accommodate Commissioners and visitors from Portugal.

BURIAL CASKET BUILDING. No. 46.

Size, 40 feet by 20 feet.

Is intended to exhibit various designs of funeral caskets, and is situated north of Extension to Art Gallery, on Lansdowne drive, near the bridge. A one story frame building, with turrets.

COAT AND BAGGAGE SERVICE BUILDINGS. No. 47.

Architects, BALDERSTON & HUTTON, Philadelphia.—Size, 25 feet by 30 feet.

DEPARTMENT OF PUBLIC COMFORT COMPANY, Limited.

W. MARSH KASSON, Chairman, Philadelphia.

Contains conveniences for checking small baggage, wearing apparel, baskets, umbrellas, bundles, etc., which are retained until called for, or delivered at designated points within the grounds. The chief offices are located as follows: One at the north entrance of Belmont Avenue; another on Lansdowne drive near the entrance from the Reading Railroad, and the third at the southeast corner of the Main Exhibition Building; are one-story frame structures. In connection with these are spaces within the principal Exhibition buildings, devoted to the same purposes. All of these offer for sale newspapers, periodicals, photographs, stationery, etc. Umbrellas are furnished both for sale and hire. At these points are facilities for transmitting messages by telegraph or messenger boys, and for obtaining rolling chairs.

ENGLISH BOILER HOUSE. No. 52.

Size, 24 feet by 71 feet.

A composite wood and stone building, furnishing steam to English and other foreign exhibitors in Machinery Hall, and situated to the south of it.

CORLISS BOILER HOUSE. No. 54.

Architects, PETTIT & WILSON, Philadelphia.—Size, 40 feet by 80 feet.

CORLISS STEAM ENGINE COMPANY, Providence, R. I.

Is built of composite stone and wood, and furnishes steam for the Corliss engine in Machinery Hall from twenty vertical tubular boilers, aggregating 1400 horsepower. It is situated south of Machinery Hall.

LIPPINCOTT'S SODA-WATER FOUNTAINS.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size: two 20 feet in diameter; one 24 feet in diameter.

CHARLES LIPPINCOTT & Co., Philadelphia.

These pavilions, three in number, are situated in different parts of the grounds.

STOKES & PARRISH MACHINE SHOP, etc. No. 57.

Size, 112 feet by 60 feet.

STOKES & PARRISH, Philadelphia.

Constitutes a part of Annex No. 2 to Machinery Hall, and is intended to execute repairs and machine work for the exhibitors. It is located south of Machinery Hall.

NEVADA QUARTZ MILL. No. 59.

Size, 60 feet by 43 feet.

STATE OF NEVADA.

Exhibits the process of manipulating ores and precious metals. It is a one story frame building, situated south of Machinery Hall.

GAS MACHINE. No. 60.

Octagonal, 15 feet in diameter.

J. C. TIFFANY, Boston, Mass.

Exhibits the mode of generating a fixed illuminating gas. A one story frame structure, situated south of Machinery Hall.

STARR'S IRON WORKS. No. 66.

JESSE W. STARR & SON, Camden, N. J.

The space allotted to Messrs. Starr & Son is occupied with gas works, pipes, special castings, stop-valves, lamp-posts, and fire hydrants. It is located southwest of Machinery Hall, close to the barrier,

GUNPOWDER PILE DRIVER. No. 67.

Size, 35 feet by 12 feet.

GUNPOWDER PILEDIVING CO., Philadelphia.

Is built in the open air to exhibit the operation of pilediving by means of gunpowder. It is situated southwest of Machinery Hall, between it and the barrier.

AUTOMATIC RAILROAD. No. 68.

Size, 20 feet by 150 feet.

CHARLES W. HUNT, New York.

Illustrations of the mode of unloading vessels by means of a railroad worked by a self-acting apparatus. Is situated west of Machinery Hall.

ENGLISH LOCOMOTIVE "JOHN BULL." No. 70.

Size, 10 feet by 121 feet, track.

PENNSYLVANIA RAILROAD COMPANY, Altoona, Pa.

The first locomotive that ran on the New Jersey Railroad in 1831.

GILLENDER & SONS' GLASSWARE BUILDING. No. 73.

Architect, JAMES H. WINDRIM.—Size, 60 feet by 90 feet.

GILLENDER & SONS, Philadelphia.

A one story frame house, situated west of Machinery Hall, on the walk to the Fifty-second Street entrance.

SAWMILL. No. 74.

Architects, PETTIT & WILSON, Philadelphia.—Size, 276 feet by 80 feet. Boiler house, 48 feet by 30 feet.

UNITED STATES CENTENNIAL COMMISSIONERS.

Exhibits direct-acting steam saw machines and gang saws. Is on Fountain Avenue, west of Machinery Hall, and consists of a one story frame open building, with a boiler house attached.

SAWMILL., No. 75.

Size, 22 feet by 36 feet.

E. W. ROSS & Co., Fulton, N. Y.

Is situated southwest of Machinery Hall, near Fountain Avenue. Is a one story frame building, with boiler house, and exhibits a direct-acting circular saw.

CAMPBELL PRINTING PRESS BUILDING. No. 76.

Architect, ALEXANDER B. BARY.—Size, 88 feet by 144 feet.

CAMPBELL PRINTING PRESS AND MANUFACTURING CO., Brooklyn, N. Y.

The various printing presses manufactured by this company are exhibited in operation; the power is furnished by a thirty (30) horse-power engine and boiler. Speci-

mens of type printing from the date of the invention, and of sunlight printing, are shown, and a complete printing office just as it was in 1776 is also in operation.

FULLER, WARREN, & CO.'S STOVE BUILDING. No. 77.

Size, 60 feet by 45 feet.

FULLER, WARREN, & CO., New York city, Chicago, Ill., Cleveland, O., and Troy, N. Y.

Located at the east end of Machinery Hall, and facing the Fountain of the Catholic Total Abstinence Society. It contains samples of stoves, heaters, and ranges in operation; is built of wood, one story high, surmounted by a cupola.

LIBERTY STOVE WORKS. No. 78.

Architect, C. C. PHILLIPS.—Size, 45 feet by 34 feet.

CHARLES NOBLE & Co., Philadelphia.

A one story frame building, located west of Machinery Hall, and south of the Catholic Total Abstinence Fountain, on Fountain Avenue; containing different varieties of heaters, stoves, and ranges manufactured by Noble & Co.

BOSTON "HERALD," AND BOSTON "DAILY ADVERTISER." No. 79.

Size, 29 feet by 16 feet.

A one story frame building, situated on Fountain avenue opposite northwest corner of Machinery Hall; used as the headquarters of the correspondents and attaches of the newspapers erecting it.

CATHOLIC TOTAL ABSTINENCE FOUNTAIN. No. 80.

Architect, HERMAN KIRN, Philadelphia.

Situated at the junction of Fountain Avenue and the Avenue of the Republic, at the northwestern corner of Machinery Hall. In design it is a circular platform, with four arms projecting at right angles, terminating in four smaller circular platforms. From the centre of the large circle rises a marble rockwork sixteen feet high, with a diameter of eighteen feet at base, on which stands a statue of Moses smiting the rock. The water descends from numerous fissures into a basin forty feet in diameter. On each of the circular platforms is a drinking fountain, twelve feet in height and eight feet eight inches in diameter, surrounded with statues nine feet high, representing Father Mathew, Charles Carroll, Archbishop John Carroll, and Commodore John Barry. It has been erected by contributions made by the numerous societies forming the Catholic Total Abstinence Union of America.

TURKISH CAFÉ. No. 82.

Architect, PIERRE MONTANI.—Size, 51 feet by 65 feet.

TURKISH COMMISSION.

An octagonal building, with a coffee-room, parlors, and bazaars. Is a one story frame building, situated on a walk between Fountain Avenue and the Avenue of the Republic, near their junction north of Machinery Hall.

PENNSYLVANIA STATE BUILDING. No. 83.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 97 feet by 55 feet.

A two story frame building, with a tower, of Gothic style. It faces the Lake, between Fountain Avenue and the Avenue of the Republic; contains reception-rooms and offices for the use of the State Commissioners and visitors.

HUMPHREYS' Homeopathic Medicine Co.,

Humphreys' Homeopathic Specifics, Humphreys' Veterinary Specifics, Humphreys' Witch Hazel Oil and Marvel of Healing.

Dealers in Homeopathic Books and Medicines, Tinctures, Triturations, Sugar of Milk, Pellets, Labels, Bell's Homeopathic Cocoa, etc.

No. 362 BROADWAY, NEW YORK.

HUMPHREYS' HOMEOPATHIC SPECIFICS.

Prices of Single Vials and Cases.

No.	CURES	CENTS.	
		25	OR 50
1.	Fever, Congestion, Inflammations	25	" 50
2.	Worm Fever, Worm Colic, or Disease	25	" 50
3.	Colic, Crying and Wakefulness of Infants	25	" 50
4.	Diarrhœa of Children and Adults	25	" 50
5.	Dysentery, Gripings, Bilious Colic	25	" 50
6.	Cholera, Cholera Morbus, Nausea, Vomiting	25	" 50
7.	Coughs, Colds, Hoarseness, Bronchitis	25	" 50
8.	Toothache, Faceache, Neuralgia	25	" 50
9.	Headache, Sick Headache, Vertigo	25	" 50
10.	Dyspepsia, Deranged Stomach, Costiveness	25	" 50
11.	Suppressed Menses, Scanty, or Delaying	25	" 50
12.	Leucorrhœa, Bearing Down, Profuse Menses	25	" 50
13.	Croup, Hoarse Cough, Difficult Breathing	25	" 50
14.	Salt Rheum, Eruptions, Erysipelas	25	" 50
15.	Rheumatism, Pain in Back, Side, or Limbs	25	" 50
16.	Fever and Ague, Intermittent Fever		50
17.	Piles, Internal or External, Blind or Bleeding		50
18.	Ophthalmia, Weak or Inflamed Eyes		50
19.	Catarrh, Acute or Chronic, Dry or Flowing		50
20.	Whooping-Cough, Spasmodic Cough		50
21.	Asthma, Oppressed, Difficult Breathing		50
22.	Ear Discharges, Hardness of Hearing		50
23.	Scrofula, Swellings and Ulcers		50
24.	General Debility, or Physical Weakness		50
25.	Dropsy, Fluid Accumulations		50
26.	Sea-Sickness, Nausea, Vomiting		50
27.	Urinary Diseases, Gravel, Renal Calculi		50
28.	Nervous Debility, Seminal Weakness	\$1	00
29.	Sore Mouth, or Canker		50
30.	Urinary Incontinence, Wetting the Bed		50
31.	Painful Menses, Pruritus		50
32.	Diseases of the Heart, Palpitations, etc.	1	00
33.	Epilepsy and Spasms, St. Vitus' Dance	1	00
34.	Diphtheria, or Ulcerated Sore Throat		50
35.	Chronic Congestions, Headaches		50

FAMILY CASES.

No.		PRICE.
1.	With 35 Large Three-drachm Vials, ROSEWOOD CASE, and Humphreys' Homeopathic Mentor (New Book)	\$12 00
2.	With 35 Large Three-drachm Vials, MOROCCO CASE, and Specific Homeopathic Manual (Small Book)	10 00
4.	With 20 Large Three-drachm Vials, MOROCCO CASE, and Specific Homeopathic Manual	6 00
5.	With 20 Large Three-drachm Vials, PAPER CASE, and Specific Homeopathic Manual	5 00
15.	With 8 Two-drachm Vials, SINGLE-FLAT (pocket), and Manual	1 75

These Cases and Medicines are sent by express or mail, free on receipt of the price.

POP CORN BUILDINGS. Nos. 84, 164.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 41 feet by 32 feet each.
J. A. BAKER, Dayton, Ohio.

One of these buildings is situated on Fountain Avenue opposite the northern extremity of the Lake; the other is on Agricultural Avenue, east of and opposite the New England Farmers' Home and Modern Kitchen. They are devoted exclusively to the sale of pop corn; are built of wood, one story high.

AMERICAN NEWSPAPER EXHIBITION. No. 85.

Architect, M. J. MORAILL, Brooklyn, N. Y.—Size, 70 feet by 46 feet.
GEO. P. ROWELL & CO., New York City.

A two-story frame structure of Swiss architecture, on Fountain Avenue, near the Lake. It contains a large hall, and a reading-room supplied with newspapers from all parts of the United States.

COLONEL LIENARD'S GEORAMA. No. 86.

Designer, COL. LIENARD, Paris.—Size, area 1250 square feet.

An open-air exhibit, models of the cities of Paris and Jerusalem, in gypsum. The contour of the ground is shown, and the streets appear fully delineated. It is in the centre of Fountain Avenue, at the head of the Lake.

NEW YORK "TRIBUNE" BUILDING. No. 89.

Architect, E. E. RATH.—Size, 30 feet by 21 feet.
NEW YORK TRIBUNE, New York.

A small octagonal wooden building, with verandas and a high tower-like roof. It is located close to the French Restaurant and the Lake, and is used as an office for the correspondents and reporters of "The Tribune."

"TROIS FRÈRES PROVENÇAUX" RESTAURANT. No. 90.

Architect, LEHMAN, of Paris.—Size, 177 feet by 110 feet.
LOUIS GOYARD, Proprietor.

A two story frame structure, situated on the corner of Belmont and Fountain Avenues. It has large garden surroundings, and is a duplicate of the restaurant of the same name in Paris as regards its management.

SONS OF TEMPERANCE FOUNTAIN. No. 91.

Size, 25 feet in diameter.

This fountain is built of wood, the structure enclosing it being circular in form, and it is situated at the junction of Fountain and Belmont Avenues.

WORLD'S TICKET OFFICE. No. 93.

Architect, H. J. SCHWARZMANN.—Size, 60 feet square.
COOK, SON, & JENKINS, London, New York, and Philadelphia.

Situated immediately north of the eastern end of Machinery Hall. It is hexagonal in form, and contains a main hall and four private offices. Tickets to all parts of the world are offered for sale, and ornamental articles manufactured in Palestine are exhibited.

PRESSED FUEL COMPANY'S BUILDING. No. 95.

Polygon, 24 feet in diameter.
E. F. LOISEAU, Philadelphia.

Constructed of iron and situated in a garden plot on the Avenue of the Republic, west of the Lake and opposite to Machinery Hall. It exhibits the fuel in a state of combustion, to demonstrate its economy and adaptability.

CENTENNIAL BOARD OF FINANCE OFFICE. No. 96.

Architect, H. J. SCHWARZMANN.—Size, 140 feet by 212 feet.

A one story frame building, situated on the left hand side of the main entrance to the Exhibition grounds, and occupied by the Board of Finance for the transaction of daily business.

U. S. CENTENNIAL COMMISSION OFFICE. No. 97.

Architect, H. J. SCHWARZMANN.—Size, 192 feet by 140 feet.

Located on the right hand side of the main entrance to the Exhibition grounds. It is built of wood, one story high, and is used as a business office by the Centennial Commission.

BARTHOLDI'S FOUNTAIN. No. 98.

Architect, BARTHOLDI, of Paris.—Size, basin, 26 feet in diameter; height, 30 feet, statue, 11 feet.

Situated in the Esplanade in front of the main entrance to the grounds.

JERUSALEM BAZAAR. No. 99.

Architects, NACHLY & BROS., Jerusalem.—Size, 12 feet by 8 feet.

NACHLY & BROS., Jerusalem.

The proprietors are Syrian Christian natives, who exhibit fancy work made from olive wood, the trees having grown on the Mount of Olives, Mount Hebron, Valley of the Jordan and Jericho. It is a one story building, situated on Fountain Avenue at the northern extremity of the Lake.

BISHOP RICHARD ALLEN'S MONUMENT. No. 106.

Size, base 6 feet by 6 feet; height, 16 feet.

Erected in memory of the Rev. Richard Allen, founder and first bishop of the African Methodist Episcopal Church; situated between Fountain and State Avenues, west of the United States Government Buildings.

CANADIAN LOG HOUSE. No. 109.

Size, 40 feet by 64 feet.

CANADIAN COMMISSION.

Is one story high, constructed of logs, and located close by the British Government Buildings.

ARKANSAS STATE BUILDING. No. 110.

Architect, ALEXANDER B. BARY.—Octagonal; 82 feet in diameter, 5000 square feet in area.

One story high, constructed of wood, with cupola, located north of the Catholic Total Abstinence Fountain, and will contain an exhibition of State productions, relics, and descriptions of ancient works.

WEST VIRGINIA STATE BUILDING. No. 112.

Size, 115 feet by 40 feet.

Northwest of the Catholic Total Abstinence Fountain, built of wood, two stories high. Headquarters for State Commissioners and visitors from West Virginia.

SPANISH GOVERNMENT BUILDING. No. 113.

Decagonal; 50 feet in diameter.

A one story frame building, situated on the Avenue of the Republic, west of the Catholic Total Abstinence Fountain. Intended as headquarters of the Spanish officers and soldiers, and a resort for Spaniards visiting the Exhibition.

SPANISH EXHIBITION BUILDING. No. 114.

Architect, ALEXANDER B. BARY.—Size, 80 feet by 100 feet.

Constructed of wood, in a style similar to Machinery Hall; adjacent to Spanish Government Building.

JAPANESE BAZAAR. No. 115.

Architect, MATSUO-EHE, Tokio.—Size, 102 feet by 48 feet.

This building, usually called the Japanese Government Building, is intended to represent the bazaars or shops of Tokio. The wood and other articles that enter into its composition, and also the vases and flowers in the surrounding garden, were imported from Japan, and all the work has been done by Japanese artisans. It is situated on Agricultural Avenue, east of the Judge's Hall, and north of the Public Comfort Building.

MISSISSIPPI STATE BUILDING. No. 116.

Size, 42 feet by 25 feet.

Situated on State Avenue, opposite and west of the Japanese Dwelling.

GEORGE'S HILL RESTAURANT. No. 117.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 112 feet by 72 feet.

TALMAN & KOHN, Philadelphia.

Located in the western portion of the grounds, on George's Hill, in the vicinity of the State buildings. It is a one story structure, built of wood, and is also called the Hebrew Restaurant.

CALIFORNIA STATE BUILDING. No. 118.

Size, 55 feet by 105 feet.

A two story frame building, situated on State Avenue, opposite the British Government Buildings. It contains accommodations for the State Commissioners and visitors, also a large hall for the purpose of exhibiting specimens of the agricultural productions of California.

NEW YORK STATE BUILDING. No. 119.

Architects, CROFF & CAMP.—Size, 60 feet by 34 feet.

The Commissioners of the State of New York have offices in this building. It is a two story structure, surrounded by about half an acre of grounds.

BRITISH GOVERNMENT BUILDINGS. Nos. 120, 121, 122.

Architect, THOMAS HARRIS, of London.—Size, No. 1, 5000 sup. feet; No. 2, 1200 sup. feet.

These edifices have been erected for the use of the members of the Royal Commission. The large one is the residence of the Commissioners and delegates, while the smaller furnishes accommodations for the members of the staff. They are built in a picturesque, half-timbered style, essentially English, and are located north of Machinery Hall. A bake house and laundry is also attached to the above.

OHIO STATE BUILDING. No. 126.

Architects, HEARD & SONS, Cleveland, O.—Size, 45 feet by 44 feet, and annex, 60 feet by 40 feet.

A two story stone pavilion, located at the junction of State and Belmont Avenues. It supplies accommodation for the State Commissioners.

1 Hoffman, A. O., Thompson, Wm., and others, Springfield, O.—Springfield limestone, course No. 16. 102

2 McNally, Wm. G., Cleveland, Ohio.—Coat of arms of Ohio carved from Berea stone. 102

3 Berea Stone Co., Berea, Ohio.—Berea sandstone, course Nos. 1 and 2. 102

4 Hurst, J. R., Cleveland, Ohio.—Independence sandstone, course No. 4. 102

5 Ford, O. D., Cleveland, Ohio.—Euclid sandstone, course No. 3. 102

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| <p>6 Halderman, L., & Son, Cleveland, Ohio.—Amherst stone, course No. 5, and window No. 4. 102</p> <p>7 Wagner, John, Cleveland, Ohio.—Independence sandstone, course No. 6. 102</p> <p>8 Amherst Stone Co., Cleveland, Ohio.—Amherst stone, course No. 7. 102</p> <p>9 Black River Stone Co., Cleveland, Ohio.—Stone from Grafton, Ohio, course No. 8 and window No. 10. 102</p> <p>10 Paul, John, & Co., Massillon, Ohio.—White sandstone from Massillon, Ohio, course No. 9. 102</p> <p>11 Wilson & Hughes Stone Co., Cleveland, Ohio.—Amherst stone, course No. 10 and window No. 9, and Independence stone, course No. 19. 102</p> <p>12 Clough Stone Co., Amherst, Ohio.—Amherst stone, course No. 11, and one-half front entrance. 102</p> <p>13 Worthington & Sons, Amherst, Ohio.—Amherst stone, course No. 12, and one-half front entrance. 102</p> <p>14 Ohio Stone Co., Cleveland, Ohio.—Amherst stone, course No. 13. 102</p> <p>15 McDermott, J., & Co., Cleveland, Ohio.—Berea stone, course No. 14 and window No. 8. 102</p> <p>16 Coshocton Stone Co., Coshocton, Ohio.—Sandstone, course No. 15 and window No. 2. 102</p> <p>17 Stitt, Price, & Co., Columbus, Ohio.—Columbus limestone, course No. 16. 102</p> <p>18 Finnegan, M., Cincinnati, Ohio.—Cincinnati stone, window No. 3. 102</p> <p>19 Finnegan, J. H., Cincinnati, Ohio.—Cincinnati stone, course No. 18. 102</p> <p>20 Montgomery, R. M., Youngstown, Ohio.—Sandstone, part of course No. 20. 102</p> <p>21 Caldwell & Tod, Youngstown, Ohio.—Stone from Tod quarry, part of course No. 20. 102</p> | <p>22 Byers & McIlhainy, Youngstown, Ohio.—Stone from Youngstown, part of course No. 20. 102</p> <p>23 Mauser & Haid, Youngstown, Ohio.—Stone from Youngstown, part of course No. 20. 102</p> <p>24 Hamilton, Homer, Youngstown, Ohio.—Stone from Youngstown, part of course No. 20. 102</p> <p>25 Warthorst & Co., Massillon, Ohio.—Stone from Massillon, course No. 21. 102</p> <p>26 Stocking, Z. S., Mansfield, Ohio.—Red sandstone from Mansfield, two vestibule windows. 102</p> <p>27 Bosler, Marcus, Dayton, Ohio.—Dayton limestone, part of gable end and three windows. 102</p> <p>28 Huffman, Wm., Dayton, Ohio.—Dayton limestone, part of front gable and three windows. 102</p> <p>29 Diamond Glass Co., Ravenna, Ohio.—Double-thick glass, from ground white sandstone, in windows. 214</p> <p>30 American Inlaid Wood Co., Cleveland, Ohio.—Inlaid wood floor, ladies' parlor. 227</p> <p>31 Garry Iron Roofing Co., Cleveland, Ohio.—Sections of corrugated iron roof. 227</p> <p>32 American Sheet and Boiler Plate Co., Cleveland, Ohio.—Section iron roofing tile. 227</p> <p>33 House & Davidson, Cleveland, Ohio.—Pair front doors. 227</p> <p>34 Champion Fence Co., Kenton, Ohio.—Wrought and malleable iron fence and gate. 283</p> <p>35 Buringer Bros., Dayton, Ohio.—Ohio coat of arms of galvanized iron, in gable. 291</p> <p>36 Heard & Sons, Cleveland, Ohio.—Architectural design of building. 441</p> |
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INDIANA STATE BUILDING. No. 127.

Size, 50 feet by 42 feet.

A two-story frame building, on State Avenue, opposite the United States Government Buildings, containing accommodations for the State Commissioners and for visitors from Indiana.

ILLINOIS STATE BUILDING. No. 128.

Architects, WHEELOCK & THOMAS.—Size, 60 feet by 40 feet.

Situated on State Avenue, north of the United States Government Buildings; the headquarters of the Illinois Commissioners.

WISCONSIN STATE BUILDING. No. 129.

Size, 50 feet by 40 feet.

For the accommodation of the State Commissioners. Located on State Avenue, north of the United States Government Exhibition Buildings.

MICHIGAN STATE BUILDING. No. 130.

Size, 50 feet by 44 feet.

On State Avenue, opposite the United States Government Buildings. Contains reception rooms and offices for the Commissioners and visitors.

NEW HAMPSHIRE STATE BUILDING. No. 131.

Size, 30 feet by 40 feet ; two projections 9 feet by 15 feet each.

In the style of an Italian villa, two stories in height, and containing ten rooms, the roof protected by an awning and used for an outlook.

CONNECTICUT STATE BUILDING. No. 132.

Architect, DONALD G. MITCHELL.—Size, 30 feet by 40 feet.

This cottage is erected in the old Colonial style, somewhat modified, and is designed for the use of the citizens and exhibitors of the State of Connecticut. It is situated on State Avenue, not far distant from the United States Government Exhibition Buildings.

MASSACHUSETTS STATE BUILDING. No. 133.

Size, 85 feet by 56 feet.

Situated on State Avenue, opposite the New York State Building; is built of wood, two stories high, and contains offices and rooms for Commissioners and visitors.

DELAWARE STATE BUILDING. No. 134.

Size, 54 feet by 34 feet.

Built on the Swiss-Gothic style, from native woods of the State. It is occupied by the State Commissioners, the first floor being used for reception rooms, while the second floor is devoted to business purposes. Is situated on State Avenue, north of the British Commission, opposite the New York State Commission.

MARYLAND STATE BUILDING. No. 135.

Size, 92 feet by 60 feet.

For the use of the State Commissioners and visitors. Situated on State Avenue, north of the British Government Buildings, and is built of wood two stories high.

IOWA STATE BUILDING. No. 137.

Size, 40 feet by 60 feet.

Located on State Avenue, opposite the California State Building. A frame house, two stories high, accommodating the State Commissioners.

MISSOURI STATE BUILDING. No. 138.

Architect, L. C. MILLER, St. Louis.—Size, 58 feet by 48 feet.

Headquarters of the Missouri Commissioners. Constructed of wood, two stories high. Located on State Avenue, opposite George's Hill Restaurant.

BREWERS' BUILDING. No. 153.

Architect, H. J. SCHWARZMANN.—Size, 272 feet by 96 feet.

G. BERGNER, Philadelphia.

Constructed of wood in the style of Machinery Hall, and situated on Lansdowne drive, opposite the northeast corner of Agricultural Hall. It contains a model brewery, and exhibits the several processes of manufacturing malt liquors.

BUTTER AND CHEESE FACTORY. No. 154.

Size, 100 feet by 116 feet.

A model factory, three stories high, built of wood, and situated east of the Agricultural Building, between it and Lansdowne drive.

TEA AND COFFEE PRESS EXTRACT BUILDING. No. 155.

Architects, HAYES & McIVOR, Elmira, N. Y.—Size, 100 feet by 45 feet.

A two-story frame building, composed of four observatories connected by verandas. Located opposite the southeast corner of the Agricultural Building; and devoted to the exhibition of the process of making coffee, tea, and other extracts, by means of pressure caused by the expansion of the materials used.

THE AMERICAN RESTAURANT. No. 156.

Architects, H. J. SCHWARZMANN, HUGH KAFKA.—Size, 300 feet by 200 feet.
TOBIASON & HEILBRUN, Philadelphia.

Situated between Agricultural and Horticultural Halls. The seating capacity is five thousand. The banquet room accommodates six hundred guests. The waiters speak various languages. There is a pavilion devoted to ice cream, etc. A bill of fare will be served either *à la carte* or *table d'hôte*.

KANSAS STATE BUILDING. No 157.

Architect, E. F. KARR.—Size, 132 feet square.

This structure is intended for the accommodation of the Commissioners from the State of Kansas, and also for exhibition purposes. It is a two story wooden building, containing an exhibition hall, private rooms and offices, and is situated opposite the Women's Pavilion.

THE "SOUTH" RESTAURANT. No. 158.

Architect, H. J. SCHWARZMANN.—Size, 182 feet by 92 feet.
E. MERCER, Atlanta, Ga.

Situated on the northwest corner of State and Belmont Avenues, and is a one story frame building.

NEW JERSEY STATE BUILDING. No. 159.

Architect, CARL PFEIFFER, New York.—Size, 56 feet by 82 feet.

A two story wooden building erected for the accommodation of the New Jersey State Commissioners, containing offices and private rooms. It is erected on Belmont Avenue, adjacent to the Women's Pavilion. Messrs. Hall & Son, of Perth Amboy, N. J., furnished the brick in the chimney, and Messrs. Maurer & Brevier, of Perth Amboy, the tiles used in the roofing of the building.

WOMEN'S SCHOOL HOUSE, OR KINDERGARTEN. No. 161.

Architect, JAS. P. SIMS.—Size, 35 feet by 18 feet.

Situated northeast of the Women's Pavilion. Contains specimens of school work, and illustrates the operation of Kindergarten teaching.

NEW ENGLAND FARMER'S HOME AND MODERN KITCHEN. No. 163.

Size, 49 feet by 35 feet.

MISS E. B. SOUTHWICK, Boston.

A representation of a New England farmer's home 100 years ago, combined with a modern kitchen, thus illustrating 1776 and 1876. It is one story high, and situated on the corner of State and Agricultural Avenues.

GERMAN RESTAURANT. No. 170.

Architect, H. J. SCHWARZMANN.—Size, 200 feet by 150 feet.

PHILIP J. LAUBER, Philadelphia.

Contains three acres for garden arrangements, and is situated north of Horticultural Hall, on Lansdowne drive.

CENTENNIAL WATER-WORKS.

Architect, FREDERICK GRAFF, Philadelphia.—Size, 70 feet by 39 feet; chimney 80 feet high.

Located on the banks of the Schuylkill River, near the Belmont steamboat landing; a one-story brick building, containing a Worthington duplex engine, on exhibition, which is capable of pumping 6,000,000 gallons per day; and a smaller one with the capacity of 1,000,000 gallons per day.

BOOT-BLACKING PAVILIONS.

Architects, **BALDERSTON & HUTTON**, Philadelphia.—Octagon, 25 feet in diameter.
DEPARTMENT OF PUBLIC COMFORT COMPANY, Limited.
W. MARSH KASSON, Chairman, Philadelphia.

Five one story frame buildings, located in different portions of the grounds. Newspapers, periodicals, photographs, umbrellas for sale and hire, stationery, fruits, etc., are on sale. There are also telegraph and messenger stations and rolling chairs.

CLARK & COMPANY'S BUILDING.

Size, 40 feet square.
CLARK & CO.

Built for the purpose of exhibiting self coiling shutters, and situated between Belmont Avenue and Lansdowne drive. It is a one story frame building surmounted by a tower.

WARREN FOUNDRY AND MACHINE SHOP.

Size, 25 feet by 25 feet.
PHILLIPSBURG, N. J.

Represents cast iron gas and water pipes, unprotected from the weather, no building being considered necessary. The exhibit is located southwest of Machinery Hall, between it and the barrier.

TUFT'S SODA-WATER PAVILIONS.

Architect, **F. H. SHEPHERD**.—Size, first, 24 feet by 14 feet. Second, 36 feet square.
JAS. W. TUFTS, Boston.

These pavilions, three in number, are located in different parts of the grounds, and are built of wood, one story high; used for the sale of soda-water.

MINERAL ANNEXES.

Architects, **HENRY PETTIT & JOS. M. WILSON**, Philadelphia.—Size, 40 feet by 576 feet; 35 feet by 312 feet.

Contain minerals from all parts of the country. Are two in number, built of wood, and are located on the south side of the east end of the Main Exhibition Building.

POLICE STATIONS.

Architect, **H. J. SCHWARZMANN**.—Size (5), 82 feet by 37 feet; (1) 167 feet by 80 feet.

Five of these stations are one story frame buildings, and one is two stories high. They are similar in construction, containing offices and dormitories for the members of the police force, and cells for prisoners. The largest station house has a courtroom and alderman's office. They are located in different portions of the grounds.

INDEX OF EXHIBITORS.

DEPARTMENT V. AND SPECIAL BUILDINGS.

- Abbott, Mrs. E. F., Stand, 82.
 Abendroth and Root Mfg. Co., Boiler, 29.
 Abercrombie, W., Machine, 43.
 Abrahamson, A. F., Boat, 52.
 Adams, J., & Co., Boat, 38.
 Adams, J. L., Cutter, 45.
 Adams & Keen, Leather, 63.
 Adams & Shaler, Leather, 62.
 Adelskold, C. A., Model, 52.
 Adler & Clement, Shoes, 57.
 Air Burning Co., Ironing Table, 41.
 Albright, A., Harness, 58.
 Albright & Stroh, Coal Jig, 17; Pump, 32.
 Alcott, T. J., Wheel, 29.
 Alexander Bros., Belting, 30.
 Alexander, E. H., Skins, 62.
 Alléoud, E., Siphon Pumps, 49.
 Allen, B., Governor, 31.
 Allin's Sons, J., Anti-lamina, 31.
 Allen, J. H., Evaporator, 38.
 Allison & Bannan, Engines, 32.
 Allison, W. C., & Sons, Tubing, 35.
 Alsing, J. R., Model, 51.
 Alter, Frank, & Co., Boots, 57.
 Ambler, W., Machinery, 40.
 Amer, W., & Co., Leather, 63.
 American Buttonhole Machine Co., 24.
 American Buttonhole Machine Co., 80.
 American Carburetter Co., 18.
 American Dredging Co., 39.
 American Engine Co., 27.
 American File Co., 23.
 American Inlaid Wood Co., 96.
 American Life Saving Suit Co., 38.
 American Meter Co., 18.
 American Oil Cabinet Co., 31.
 American Paper Car Wheel Mfg. Co., 36.
 American Road Steamer Co., 28.
 American Saw Co., 20.
 American Sheet and Boiler Plate Co., 96.
 American Ship Windlass Co., 39.
 American Shoe Tip Co., 61.
 American Tubular Iron and Steel Assoc., 30.
 American Twist Drill Co., 20.
 American Watch Co., 26.
 American Whip Co., 59.
 Amersfoort, Mrs. H. M., Oratorio, 84.
 Ames Iron Works, 28.
 Ames Manufacturing Co., Lathes, 21.
 Amherst Stone Co., 96.
 Anchor Iron Works, 42.
 Andersson, A., Paintings, 84.
 Anderson, J. P., Grater, 37.
 Andersdotter, M., Embroidery, 84.
 Andrew, J. E. H., Machines, 42.
 Andrus & Wallace, Purifier, 28.
 Anger, E., Models, 45.
 Ankarsrum's Works, Switches, 52.
 Annear, J., Blacking, 56.
 Anthony, Mrs. S. E., Picture, 81.
 Appert, M., Hooks, 47.
 Appleby Brothers, Cranes, 41.
 Appold, G., & Sons, Leather, 61; Skins, 63.
 Aquometer Steam Pump Co., 31.
 Arbel, L., Wheels, 47.
 Arbey, F., Machines, 46.
 Arboga Foundry and Machine Mfg. Co., 52.
 Archbold, S., Meters, 33.
 Arentz, H., Models, 52.
 Armour Knitting Machine Co., 25.
 Armstrong, Bro., & Co., Machinery, 19.
 Armstrong Heater Manufacturing Co., 28.
 Army Arsenal, 53, 54.
 Arnold, Mrs. C., 79.
 Asbestos Patent Fibre Co., 31.
 Asplund, H., Engine, 52; Wheels, 52.
 Atterberg, A. J., Drawings, 52.
 Atterberg, H. J., Drawing, 52.
 Aubin & Baron, Bolting Mill, 46.
 Anerbach, Mrs. A. T., Spread, 81.
 Aultman, Miller, & Co., Dynamometer, 31.
 Aurthors, Machines, 43.
 Austin, T. K., Elevator, 33.
 Automatic Book-Sewing Machine Co., 27.
 Automatic Scale Co., 36.
 Avery, J. G., Machinery, 23; Wool-spinner, 24.
 Axford & Veron, Blacking, 56.
 Babbit, F. S., Lathe, 19.
 Babcock Manufacturing Co., Engines, 33.
 Babcock & Wilcox, Boiler, 28.
 Backus, Q. S., Braces, 23.
 Bacon, L. H., Loom, 23.
 Baem, Mrs. L. C., Shades, 81.
 Baer, A. P., & Co., Leather, 61.
 Bagge, C. K., Embroidery, 84.
 Bagger, L., Press, 26.
 Baggs, J. F., Machinery, 19.
 Bagley & Sewall, Pump, 32.
 Bahia, Arsenal at, 54.
 Bain, J. W., Type-writer, 27.
 Bainbridge, E., Lamp, 40.
 Baird, G. W., Distilling Apparatus, 33.
 Baird & Huston, Engines, 29; Yacht, 38;
 Boiler, 28.
 Baird, Prof. S. F., 65.
 Baird, W., & Co., Machinery, 40.
 Baker, G. W., Machines, 38, 60.
 Baker, J. A., 93.
 Balderston & Hutton, Architects, 88, 90, 99.
 Baldwin, P., Model, 45.
 Ball, E. P., Machine, 17.
 Ballauf, L., Leather, 62.
 Baltimore Pearl Hominy Co., 37.
 Bancroft, E. F., & Co., Shoes, 58.
 Bancroft, S. H., Chair, 80.
 Banister & Tichenor, Boots, 57.
 Banks, Miss F. M., Organ, 81; Stand, 82.
 Barber, Harris, Water-wheels, 44.
 Barber & Son, Flume, 29.
 Bardes, L. C., Leather, 62.
 Bare, J., Leather, 61.
 Barnard & Leas Mfg. Co., Separators, 37.
 Barnett, G. & H., Files, 22.
 Barnum, Richardson Co., Ores, 36.
 Barrett, Mrs. A., Cabinet, 82.
 Barrett, Mrs. S. M., Panels, 82; Table, 82.
 Barrill, J., Model, 45.
 Bartholdi, Architect, 94.

- Barton, C. S., Indicator, 36.
 Bartlett, J. W. Machines, 25.
 Bartley, W. P., Engine, 44.
 Barry, A. B., Architect, 91, 94, 95.
 Bastet Magnetic Engine Co., 30.
 Batcheller, E. & A. H., & Co., Shoes, 58.
 Bates, B., Carbonators, 34.
 Bates, J., Elevator, 33.
 Battle Creek Machinery Co., 18.
 Batley, J., & Co., Machinery, 21.
 Baugh & Sons, Machine, 17.
 Bayliss, J., Forge, 20.
 Bay State Shoe and Leather Co., 57.
 Beach & Dodge, Leather, 61.
 Beach, H. L., Machine, 18.
 Beatty, F. S., Machines, 41.
 Bean, H. & B. F., Catcher, 37.
 Beautey, H., Grappler, 46.
 Beck, C., Machinery, 27.
 Beck, G. & W., Engine, 44.
 Beck, J. D., Vises, 23.
 Bechtel, J. A., & Son, Leather, 61.
 Becker, A., Card Clothing, 43.
 Becker & Sons, Balances, 35.
 Becker & Underwood, Brush, 37.
 Beckwith Sewing Machine Co., 25.
 Bedell, O. T., Wrench, 22.
 Beesley & Sons, Machinery, 40.
 Begin, P. N., Headlight, 38.
 Belfield, H., & Co., Valves, 31.
 Bell, Mrs., Crayons, 83.
 Bell, R., Needles, 48.
 Bencke & Scott, Chromo Picture, 26.
 Benkert, C., & Son, Boots, 56.
 Bent, S. S., Grate Bars, 28.
 Bentel, Margedant, & Co., Machinery, 19.
 Bens, A., Coffee Mills, 51.
 Benson, A. M., Dresser, 19.
 Berea Stone Company, 95.
 Bergner, G., 97.
 Berteau, S., Lozenge Machine, 53.
 Benthner Bros., Carders, 48.
 Beveridge, Mrs. Gov., 79.
 Beyer Bros., Machines, 48.
 Bianchini, E., Carvings, 84.
 Bickerton, Mrs. A. B., Wax Flowers, 84.
 Bickford, D., Machines, 25.
 Bide & Co., Machine, 50.
 Bieunembock & Brother, Iron Chair, 54.
 Bieunembock & Irmao, Engine, 54.
 Bigelow, H. B., & Co., Engines, 27.
 Biggs, B. F., & Wells, Pump, 32.
 Bickkers & Zoon, Fire Extinguishers, 51.
 Billings & Spencer Co., Tools, 22; Shuttles, 25.
 Bing, J., Mangle, 26; Wheel, 29; Brake Shoe, 36.
 Bixby, S. M., & Co., Blacking, 56.
 Bjorkman, C. R., Drawing, 52.
 Black River Stone Co., 96.
 Blake Crusher Co., 17.
 Blake, W. P., 74.
 Blakemore, Mrs. J. W., Painting, 83.
 Blandy, H. & F., Engines, 30.
 Blancke, C. W. J., & Co., Manometer, 48.
 Blancke, E. A. R., India-rubber, 48.
 Bliss & Williams, Presses, 21.
 Blunck, C., Pumps, 52.
 Board of Commerce, Models, 53.
 Bockius, G., Leather, 63.
 Bodemer, Georg, Regulators, 48.
 Boeck, C., Machines, 43.
 Boese, C., & Co., Machines, 38.
 Boethius, E., Cork Cutter, 51.
 Bolen, Crane, & Co., Press, 33.
 Bolinders, J. & C. G., Emery Wheels, 51.
 Bolles, J. N., Borer, 17; Engine, 29; Submarine Work, 38.
 Bollinger, O. T., Wheel, 29.
 Bonney, S. E., Muff, 80; Birds, 84.
 Boomer & Boschert Press Co., 27.
 Booth, H., & Co., Machinery, 43.
 Bordine Manufacturing Co., Wheel, 29.
 Boston & Fairhaven Iron Works, 26.
 Bosler, M., Limestone, 96.
 Boulogny, Mrs. E. P., 79.
 Bowmanville Machine Co., 42, 43.
 Bowen, Mrs. S. B., 79.
 Bowes, E., & Son, Pumps, 44.
 Bowron, W. M., Furnace, 17.
 Boyd, G., Coffee Roaster, 38.
 Bradbury, Mrs. B., 79.
 Bradford, H., Separator, 17.
 Bradford, W. H., Life Boats, 42.
 Bradley, J., & Co., Excavating Apparatus, 32.
 Bradley Manufacturing Co., Hammers, 20.
 Brainard, C. R., Distributor, 27.
 Brainard Milling Machine Co., 22.
 Branch, Crooks, & Co., Mills, 21; Belt Tightener, 30.
 Branche, H., Machines, 46.
 Brandi, J., Models, 53.
 Brandon Manufacturing Co., Scales, 35.
 Brashear, Miss L., Easel, 82.
 Braun, F., Skins, 62.
 Bravo, Miss S., Needle-work, 80.
 Brazil, P., Mill, 44.
 Breed, A. F., Shoes, 58.
 Breed, F. W., Shoes, 58.
 Breed, W. F., Dole, & Co., Boots, 58.
 Breguet, Electro-magnetic Machines, 47.
 Brehmer, E. F. A., Paper Cutter, 51.
 Bridgewater Iron Co., Forgings, 34.
 Brierly, Sons, & Reynolds, Signals, 42.
 Briggs, N. A., Machine, 26.
 Bristow, Hon. B. H., 65.
 Broadbent, T., Extractor, 41.
 Brock, Mrs. J., 79.
 Brothers, Mrs. H., Wax Flowers, 84.
 Brotherson, Mrs. H. B. M., Poem, 81.
 Brooks, C. S., Dress-cutting, 80.
 Brooks & Cooper, Anvils, 40.
 Brooks, E. A., Boots, 57.
 Brooke, H., Moulds, 22.
 Brosse, Madame S. C., Models, 80.
 Bruce's Son, G., & Co., Type, 27.
 Brunchrost & Dekke, Models, 53.
 Brunon Bros., Wheels, 47.
 Brush, G., Engines, 44.
 Brownlee, A. B., & Co., Tuyere, 20.
 Brown, A. P., & Co., Boots, 57.
 Brown, Mrs. A. V., 79.
 Brown, C. H., & Co., Engine, 30.
 Brown & Carver, Cutters, 27.
 Brown, E. T., & Co., Leather, 61. Skins, 62.
 Brown & Fergus, Injector, 31.
 Brown, Fergus, & Co., Injector, 31.
 Brown, Son, & Co., Wheels, 29.
 Brown & Sharpe Manufacturing Co., 20.
 Brown, E., Pyrometers, 31.
 Browne, J. C., Models, 41.
 Bryant, G. B., Wheels, 36.
 Bryant, J. L., & Co., Boat, 38.
 Bryan & Snyder, Plated Ware, 17.
 Brydon, R., Car, 45.
 Buck, I. D., Machine, 25.
 Buck, M., Machinery, 19.
 Buckeye Engine Co., 19, 29.
 Buckman, Mrs. E. R., 79.
 Buerman, A., Hardware, 59.
 Buffalo Steam Gauge and Lantern Co., 31.
 Buffalo Scale Co., 35.
 Buffum, C., Boots, 58.
 Bulfinch, Miss S. E., Rack, 80.
 Bulkley, J. E., & Sons, Leather, 61.
 Bullock, C. K., Machinery, 37.
 Bullock, T. H., & Co., Bellows, 20.
 Bullock Printing Press Co., 26.
 Bulmer & Sheppard, Machine, 43.
 Burger, H., Velocipedes, 51.
 Burgess & Sons, Belting, 30.
 Burgess, W. S., Pipe, 22.
 Buringer Bros, Coat of Arms, 96.
 Burns, C. C., Pump, 44.
 Burnham, Parry, Williams, & Co., Locomotives, 35.
 Burk, W. B., & Co., Machine, 18.
 Burland, Desbarats & Co., Stereotyping, 43.
 Burr, W. H., Machine, 18.

- Burt, C. S. & S., Machinery, 19.
 Burt, E. C., Shoes, 57.
 Burt, F. H., & Son, Leather, 60.
 Burt & Mears, Shoes, 57.
 Burt & Putnam, Washer, 26.
 Busby, A. G., Motor, 29.
 Bush & Howard, Leather, 62.
 Bush & Smith, Machinery, 19.
 Bush, W., & Co., Leather, 63.
 Bustin, R., Fire Escape, 44.
 Buss, C., & Sons, Machine, 18.
 Butler Braider Co., 24.
 Butler, Brown, & Co., Belt Hooks, 23.
 Butler, Dunn, & Co., Leather, 62.
 Butterworth, H. W., & Sons, Machines, 23.
 Butterworth, J., & Son, Ragpicker, 24.
 Buttkeireit, C. G., Piano, 34.
 Britton, L., & Son, Engine, 34.
 Buzzell, J. G., & Co., Machines, 60.
 Byers & McIlhainy, Stone, 96.
 Cain, P. O., & Co., Moulds, 38.
 Caldwell, Miss H. D., Cross, 82.
 Caldwell, T., Stone, 96.
 Calkins Champion Washer Co., 26.
 Caller, A., Panel, 83.
 Callery, J. C., Leather, 62.
 Campbell & Clute, Machine, 25.
 Campbell, G., Forges, 43.
 Campbell Printing Press & Mfg. Co., 91.
 Campbell, L. J., & Co., Belting, 44.
 Camozzi & Schlösser, Switch, 49.
 Canada Sewing Machine Co., 43.
 Cañarte, B. R., Typographic Works, 54.
 Canfield, W. B. & J., Boots, 57.
 Cannon, John D., Boat, 38.
 Carr, A., Pump, 32.
 Carr, Calvin, & Co., Cornice Machines, 17.
 Carnell, F. L. & D. R., Hammers, 20; Machinery, 22.
 Carnell, G., Mill, 22.
 Carré, E., Ice Machine, 47.
 Carroll, S., Compass, 46.
 Carroll, W., Machine, 23.
 Carter, J., Spinning Frame, 41.
 Car Wheel Co., 45.
 Carver Cotton Gin Co., 65.
 Cazaubon, D., Soda-water Machines, 47.
 Cazin, F. M. F., Jig, 17.
 Cassegrain, H. E., Machine, 42.
 Castle, W. W., Machinery, 21; Lifting Jack, 33.
 Cayuta Wheel and Foundry Co., 36.
 Celluloid Emery Wheel Co., 21.
 Celluloid Harness Trimming Co., 59.
 Chadeayne & Christian, Boots, 59.
 Chalmers Spence Co., Covering, 28.
 Chambers, Bro., & Co., Machine, 22; Folder, 27.
 Chambers, E., Skins, 62.
 Champion Fence Co., 96.
 Champion Fire Extinguishing Co., 33.
 Chandler, Hon. Z., 65.
 Chapman & Co., Soda Fountain, 34.
 Chapman, Miss L. M., Table, 85.
 Chapman Valve Manufacturing Co., 35.
 Charlton Shaft Coupling, 30.
 Charland, J. B., Model, 45.
 Charland, W., Model, 45.
 Charfield, Underwood, & Co., Belting, 30.
 Chase, B. F., Blowers, 22.
 Chase Elevator Co., 37.
 Chase, F. D., Ventilating Ship Irons, 33.
 Chase Manufacturing Co., 20.
 Chase, P. E., Lathes, 21.
 Chase Turbine Mfg. Co., Saw-Mill, 18, 29.
 Chateau de Villiers Institute, Pupils' Work, 84.
 Chatillon, J., & Sons, Scales, 36.
 Chatterton, R. D., Springs, 44.
 Chaudron, J., Models, 50.
 Chauveau, Engines, 47.
 Chenaillier, Evaporator, 46.
 Chivari, Agrarian Committee of, Sulphur Machine, 53.
 Chicago Scale Co., 36.
 Child, C. C., Presses, 26; Cutter, 27.
 Childs & Bloomer, Leather, 61.
 Chisholm, R. N., Coupler, 45.
 Chormann, E. G., Machine, 26.
 Chomel, I. A., Berths, 38.
 Chretien, J., Coal Unloader, 47.
 Cicile, L., Cleaners, 47.
 Cincinnati School of Design, Furniture, 83.
 Cincinnati Shoe Manufacturing Co., 57.
 Clapp & Jones Mfg. Co., Engines, 34.
 Clark, A. B., Pump, 44.
 Clark Bros., Pipe Tongs, 23.
 Clark, Bros., & Co., Bolts, 22.
 Clark & Co., 99.
 Clark, C. W., Pump, 44.
 Clark, S. A., Paintings, 83.
 Clark, Standfield, & Co., Models, 42.
 Clark Thread Co., 19; Machinery, 23.
 Clarke, R., Lasts, 43.
 Clements, J., & Bro., Saddlery, 59.
 Cleveland Machine Works, 24.
 Cleveland Paper Box Machine Co., 27.
 Cleveland Steam Gauge Co., 31.
 Cleveland's Scale Works, 36.
 Clough Stone Co., 96.
 Coats, J. & P., Thread Works, 41.
 Coblenz Electrotypes, 46.
 Coe, C. W., Press, 21.
 Coffin, C. A., & Co., Shoes, 58.
 Coffin & Woodward, Pumps, 32; Capstans, 39.
 Cohen, C. J., Machine, 27.
 Cohen, Mrs. H., 79.
 Colburn, L. J., Machine, 38.
 Colton, G. D., Pumps, 32.
 Colt's Patent Fire Arms Mfg. Co., 28.
 Colvin, M. P., Machine, 80.
 Colwell Lead Co., 35.
 Collord, Miss H., Book Covers, 82.
 Collard, Miss I., Casket, 82.
 Colladay, J. O., & Bro., Machinery, 19.
 Collier, L., Machines, 42.
 Collier, Miss L. M., Tea Pot Rest, 84.
 Combined Power Co., 19.
 Conde & Co., Engine, 32.
 Conrad, Fabel, & Mooney, Leather, 60.
 Connery, J. W., Calking, 27.
 Conolly, Miss J. L., Illuminations, 83.
 Connolly & Power, Boots, 57.
 Constant Wine Press, 47.
 Constant Protective Ventilator Co., 33.
 Cobb, Z., & Sons, Springs, 36; Engine, 29.
 Coogan, O., Machine, 60.
 Cook, A. B., & Co., Pulleys, 30.
 Cook & Pulver, Lubricants, 35.
 Cook, Son, & Jenkins, 93.
 Cook, W., Feeder, 26.
 Cooke, J., & Co., Lamps, 40.
 Cooper, Miss A., Stool, 82.
 Cooper, Jones, & Cadbury, Pumps, 32; Supplies, 35.
 Cooper, Jones, & Cadbury, Lathes, 20.
 Coore, E. R. N., & Co., Machine, 43.
 Cope, E. T., & Sons, Wheel, 29.
 Copeland & Bacon, Engines, 30.
 Copping, G. W., Lozenge Machine, 45.
 Cordes, H. G., Gun, 49.
 Corey & Harper, Machine, 27.
 Corliss Steam Engine Co., 95.
 Cornely, E., Machines, 46.
 Cornell, S., Coupler, 45.
 Cornell University Machine Shops, 20, 29.
 Cornwell, Mrs. E., Chart, 80.
 Coshocton Stone Co., 96.
 Costa, F. C. da, Pumps, 54.
 Costello, P. & P., Leather, 61.
 Cotman, W., Models, 45.
 Cotter, C. S., Pumps, 32.
 Cottrell & Babcock, Presses, 26.
 Courley, C., & Co., Machine, 42.
 Couture Breaking Machine, 46.
 Coux des Roseaux, Cups, 47.
 Cox, F., Coffer Dam, 39.
 Cox, H. W., Pumps, 44.
 Cox & Sons, Tools, 21; Wheels, 29.

- Coxe Bros. & Co., Crushing Machine, 17.
 Crabb, W., Hackles, 24.
 Crane & Co., Bits, 59.
 Creed, E., Uppers, 57.
 Cresson, G. V., Pulleys, 30.
 Croff & Camp, Architects, 95.
 Croft, Wilbur, & Co., Pans, 37.
 Crosby Steam Gauge and Valve Co., 34.
 Crossley, H. A., Stair Jointer, 18.
 Crouch & Fitzgerald, Trunks, 58.
 Cruickshank, A. B., Cleats, 42.
 Crowell, Mrs. F. W., 79.
 Crowell, J. W., & Co., Models, 39.
 Cuan, Injector, 47.
 Cullum, Mrs. Gen. G. W., 79.
 Culmer Spring Co., 36.
 Cuming, M. A., Hat Press, 25.
 Cummings, G. L., Frames, 21.
 Cummings, J., & Co., Leather, 63.
 Cunningham & Co., Leather, 63.
 Curtin, R. G., M.D., 88.
 Curtis & Mitchell, Cutters, 27.
 Cushman, C. S., Attachment, 60.
 Cutlace Shoe Sewing Machine Co., 60.
 Cutter, J. D., & Co., Loom, 23.
 Cuyler, Mrs. T., 79.
 Dailey, M. E., Telescope Trestle, 44; Model of Ship, 45.
 Dalsheimer Bros., Shoes, 57.
 Dammon, S. H., Yacht, 38.
 Danforth Locomotive and Machine Works, 23, 35.
 Dane, J. F., Grinnell, & Co., Boots, 58.
 Daniels, T. E., Fire Escape, 34.
 Dansch, J. G., Tools, 48.
 Dariot, C., Lathe, 21.
 Dart, E., & Co., Engines, 32.
 Daschbach, E. J., Machine, 18.
 Date, J., Diving Apparatus, 44.
 Daughaday, J. W., & Co., Press, 26.
 Daul, A., Machine, 27.
 Davenport, Fairbain, & Co., Wheels, 36.
 Davenport, W. R., 87.
 Davey, Mrs. I., Tops, 80; Jewelry, 81; Flow-ers, 84.
 Davey, Paxman, & Co., Steam Engine, 41.
 Davidson Rubber Co., 59.
 Davis, J. B., Heater, 31.
 Davis, J. G., & Son, Machinery, 19.
 David Bros., Forges, 46, 47.
 Davis & Du Bois, Oil Cups, 31.
 Davis Sewing Machine Co., 25.
 Dayton, Mrs. W. L., 79.
 Deal, M., & Co., Machinery, 37.
 D'Allessandro, B., Life Preserver, 53.
 De Ccindry, W. A., 65.
 Dechamp, C., Safety Boiler Apparatus, 47.
 Decker, D., Leather, 61.
 De Dartem, Architect, 89.
 Deford & Co., Leather, 61.
 Degener & Weiler, Machines, 26.
 De Laval, G., Motors, 52.
 Dell, J. C., Scales, 35; Mills, 38.
 De Long Bros., Leather, 61.
 Delrez, F., Cards, 50.
 Dennisson, J. N., Fire Engine, 34.
 Deny, L., Machinery, 46.
 De Pilgrom, Miss V., Bedstead, 82.
 Deplanque Son, senior, Wheels, 46.
 Derkx-Schlopfer, I. F., Types, 50.
 Derriey, C., Typography, 47.
 Dervaux, A., Machines, 50.
 Desmond, T., Boat, 38.
 Desmoutis, Quennessen, & Le Brun, Platina App., 46.
 Desper, W. E., & Co., Meters, 33.
 Delthiou, Gilles, & Co., Cards, 50.
 De Tombay, A., Models, 50.
 Devereaux, A., & Son, Leather, 62.
 De Warne, L. E., Boots, 57.
 Dexter Spring Co., 29.
 Diamond Glass Co., 96.
 Diamond Slate Iron Co., 37.
 Dick, C. J. A., Ingots, 19.
 Dickeson, A. M., Shell Work, 84.
 Dickerson, Mrs. Y. G., Chair, 80.
 Dickson, J., & Co., Rubber, 26.
 Dickson Manufacturing Co., Locomotive, 35.
 Diest, Evan, Bed Cover, 84.
 Dinning, H., Models, 45.
 Disston, H., & Sons, Tools, 18.
 Disston, T. S., Blower, 33.
 Dixon, W. T., & Bro., Shoes, 57.
 Dixon, Smith, & Co., Belting, 44.
 Dodd, A. W., & Co., Oils, 56.
 Dodd, Mrs. W., Casket, 82; Table, 83.
 Doherty, Miss C., Plate, 82.
 Dolne, L., & Co., Belting, 50.
 Domange, Lemierre, & Co., Belting, 47.
 Domestic Sewing Machine Co., 25.
 Dominick, Mrs. G., Casket, 82; Illumina-tion, 83.
 Dominion Type Foundry, 43.
 Donnelly, Miss A., Stand, 82.
 Dornan Bros. & Co., Loom, 24.
 Douglas, W. & B., Pumps, 32.
 Douglass Manufacturing Co., Tools, 18.
 Downing & Price, Leather, 61.
 Drake, Miss A. P., Tiles, 82; Jardinière, 82.
 Draper, G., & Son, Spinning Machinery, 24.
 Dreisbach, W., & Co., Shoe Bows, 57.
 Dreyer, Simpson, & Co., Pipe, 34.
 Drummond, G. P., Type Machine, 43.
 Drury, Mrs. L., Dress-cutting, 80; Shawl, 81.
 Dubois, H. A., Polishing Machine, 48.
 Dubois, W. & F. J., Drilling Machine, 60.
 Dücker, F. F. A., Drawing, 49.
 Dugoujon, Senior, Saws, 46.
 Du Laney, G. L., & Co., Machine, 25.
 Dunn, P., Machine, 43.
 Dunn, Wm., Switch, 45; Car Coupler, 45.
 Dunn & Samson, Models, 45.
 Duncannon Iron Co., 19.
 Dunlap, Miss S., Wall Pocket, 82.
 Dunston Engine Works Co., 40.
 Durafort, Soda Water Machine, 47.
 Durand, F., & Marais, Brick Machines, 46.
 Durieux & Co., Car Wheels, 50.
 Durrschmidt, Millstones, 46, 48.
 Durvie, Kneading Machine, 582.
 Dutcher, Temple Co., Loom Temples, 23.
 Dyson Needle Co., 25.
 Eagle Meter Co., 33.
 Earl, B. A., Oiler, 19.
 Earls, R. H. C., Pictures, 83.
 East New York Boot, Shoe, and Leather Manufacturing Co., 57.
 Eaton, Hon. J., 65.
 Eaton & Ayer, Shuttles, 24.
 Eaton, Cole, & Burnham Co., Plumbers' Sup-plies, 23.
 Eccles, J., Press, 33.
 Eckfeldt & Ritchie, Butts, 30.
 Edgecomb, F. B., Flanges, 45.
 Edgemoor Iron Co., 17.
 Edoux, L., R. R. System, 47.
 Edson Gauge Manufacturing Co., 31.
 Ehrenpohl, C., Embroiderer, 84.
 Eickmeyer Hat-Blocking Machine Co., 25.
 Ekman, C., Wheels, 52.
 Elasar & Prity, Leather, 62.
 Electro-Magnetic Machine Mnf. Co., 47.
 Ellis, C. R., Heater, 28.
 Ellis, W. I., Blower, 41.
 Ely, H. G., & Co., Leather, 63.
 Emanuel, Miss L. E., Shawls, 80.
 Emerson Stone Saw Co., 21.
 Emerson's, T. Sons, Shoes, 58.
 Empire Grain Decorticator Co., 37.
 Empire Portable Forge Co., 20.
 Empire Transportation Co., 89.
 Enfer, A., jr., Forges, 46; Bellows, 47.
 Enfer, E., Forges, 46; Bellows, 47.
 English, W., Canoe, 45.
 Enterprise Manufacturing Co., Mills, 38.
 Entrekin, W. G., Enameler, 24.
 Erie City Iron Works, Engines, 28, 30.
 Erskine, M. A., & Co., Shoes, 57.

- Estrada, A., Types, 54.
 Etting, Mrs. I. M., 79.
 Eureka Bark Mill Co., 19.
 Eureka Manufacturing Co., Lathe, 18.
 Evans, Dabell, & Co., Tubing, 34.
 Evans, F. R., Gaiters, 57; Laths, 60.
 Excelior Brick and Stone Co., 22.
 Excelsior Gas Machine Co., 16.
 Exeter Machine Works, Boiler, 22; Blowers, 33.
 Fagersta Bruks Aktiebolag, Axles, 52.
 Fagersta Manufacturing Co., Saws, 51.
 Fairbanks & Ewing, Scales, 35.
 Fairbairn, Kennedy, & Naylor, Spinning Machinery, 41.
 Fairbrother, H. L., Leather, 62.
 Falley, L., & Co., Shoes, 56.
 Fargo, C. H., & Co., Shoes, 56.
 Farr, Rigby, & Co., Purifier, 37.
 Farrar, J. B., Boots, 58.
 Faulkner, Mrs. C. J., 79.
 Faure & Kessler, Chemical Apparatus, 46.
 Fay, J. A., & Co., Machine, 12.
 Feary, T., & Sons, Shoes, 57.
 Felder, C., Machines, 26.
 Fenson, S., Elevator, 44.
 Fergus, L., & D., Bottling Machine, 34.
 Ferguson, Mrs. M. L., Paintings, 83.
 Ferrari, Machine, 53.
 Ferre, S. P., Press, 26.
 Ferris & Miles, Machinery, 20; Hammers, 20; Engine, 33.
 Fichtenberg, W., Powder, 17.
 Fields, Mrs. J. T., 79; Books, 81.
 Fields, W., Wagon, 29; Rails, 36; Models, 38.
 Finnegan, J. H., Stone, 96.
 Finnegan, M., Stone, 96.
 First & Prybil, Machine, 18.
 Fish, W. L., Machines, 25.
 Fisher, J., & Co., Machine, 43.
 Fisher & Norris, Vises, 22; Rail Joints, 37.
 Fisk, J. E., Machine, 61.
 Fisse, Thirion, & Co., Bottling Machine, 47.
 Fitchburg Machine Co., 21.
 Flagg, S. G., & Co., Castings, 19; Hardware, 22; Gas Fittings, 35.
 Flather & Co., Lathes, 21.
 Fleck, A., Engine, 44.
 Fleming, G., & Sons, Engine, 44.
 Fleming, J., Machine, 43.
 Fleming, F., & Son, Machinery, 40.
 Fleming, W. A., & Co., 87.
 Fleury, J. M., Mill, 46.
 Flint, C. M., Mill, 19.
 Florence Sewing Machine Co., 25.
 Flower, J., & Bro., Hydrant, 34.
 Flynt, Mrs. O. P., Garments, 85.
 Fogg, Houghton, & Coolidge, Shoes, 58.
 Follensbee, G. S., Pump, 32.
 Folsom, A., Wheel, 29.
 Fontaine, H., Engines, 47.
 Force, Mrs. F. H., Cabinet, 83.
 Ford, O. D., Sandstone, 95.
 Forepaugh, W. F., & Bro., Leather, 61.
 Forepaugh, W. F., Jr., & Bros., Machine, 30.
 Forney, Mrs. J. W., 79.
 Forsaith, S. C., & Co., Hammers, 20; Folder, 27.
 Foss & Percy, Cotton Card, 24.
 Foster, A. J., & Co., Leather, 63.
 Foulds, T., Jr., Elevator, 33.
 Fox, J. A., Drainer, 80.
 Francis & Loutrel, Folder, 27.
 Franelseus, Mrs. A. H., 79.
 Franz & Pope, Knitting Machine Co., 24.
 Freal Bottling Machines, 47.
 Freeland, R., Machines, 42.
 Freeman, Miss F., Sculpture, 81.
 French, A., & Co., Springs, 36.
 French, E. J., Magnetics, 81.
 French, J. B., Bedsteads, 80.
 Freiberg, H., Leather, 62.
 Frere, Miss, Drawings, 83.
 Frick & Co., Engines, 27.
 Fuller, Warren, & Co., 92.
 Furlush, M. A., & Sons, Machines, 24; Loom, 24.
 Furst, B., Needle Work, 84.
 Gabel, F., Machinery, 40.
 Gaff, Fleischmann, & Co., 89.
 Gale, A. D., Harness, 59.
 Galloway, W. & J., & Sons, Boilers, 41.
 Gardella, L., Plans, 54.
 Gardner, Mrs. J., Tools, 37.
 Gardner, N. H., & Co., Leather, 62.
 Gardner, R., & Sons, Engine, 44; Brake Machine, 45.
 Gardner Bros., Boots, 58.
 Gardner Sewing Machine Co., 43.
 Gardiner Drill Co., 17.
 Garlaudat, Refrigerator, 47.
 Garmount, W., Ship Model, 45.
 Garretson, T. K., Fence, 22.
 Garrison, A., & Co., Rails, 19.
 Garry Iron Roofing Co., 96.
 Gas Motor Factory, 48.
 Gasparini, G., Hydraulic Machine, 53.
 Gassen, J. B., Gauge, 49.
 Gates, Allen, & Bro., Shoes, 57.
 Gates, J., & Sons, Belting, 30.
 Gaussart, Gas Charger, 47.
 Gavit Machine Works, 24.
 Gawthrop, A., & Son, Models, 32.
 Gehrckens, C. O., Stuffing Boxes, 49.
 General Transatlantic Co., Model, 48.
 Geneseman, Miller, & Co., Leather, 61.
 Genlee, Bro., & Co., Machinery, 19.
 German Sewing Machine Factory, 48.
 George & Du Laney, Machinery, 20.
 Gerard, P., Plow, 36.
 Gervais, E., Bottling Machines, 47.
 Getchett, J. S., Capstan, 39.
 Gibbs Loom Harness & Reed Co., 23.
 Gibson, F. N., Machine, 60.
 Gibson, F. J., Engine, 44.
 Giffard & Berger, Ice Machines, 47.
 Gilbert, E. E., Engines, 44.
 Gilbert, L. M., Painting, 83.
 Gilbertson, W., Machine, 43.
 Gildersleeve, S., & Sons, Vessels, 38.
 Gillender & Sons, 91.
 Gillespie, Mrs. E. D., 79.
 Gillis & Geoghehan, Steam Trap, 28.
 Gillmore, J. C., & Co., Trunks, 58.
 Gimson & Coltman, Machines, 41; Knitting Machine, 41.
 Gingrass, E., Models, 45.
 Girard, A., Canoe, 45.
 Gerdrum, O., Model, 52.
 Gladwin, C. P., Engines, 29.
 Gleason, J., Lathe, 19.
 Globe Manufacturing Co., 27.
 Glöckner Bros., Blocks for Breaks, 49.
 Gloucester Iron Works, Hydrants, 34.
 Goddard, Mrs. F. W., 79.
 Golding & Co., Presses, 26.
 Goldie & McCulloch, Water-Wheel, 44.
 Goldmark, J., Elevators, 33.
 Gommersall, A., Engines, 34.
 Goode, G. B., 73.
 Goodrich, J., jr., Boots, 58.
 Goodrich & Porter, Boots, 58.
 Goodrich & Whitehouse, Shoes, 58.
 Goodwin, A. H., Leaves, 84.
 Goodwin, W. W., & Co., Meters, 18.
 Goodyear Rubber Co., 59.
 Goodyear & McKay Sewing Mach. Ass'n., 60.
 Gordon, G. P., Presses, 26.
 Gordon, M. S. G., Paintings, 83.
 Gorham, W. B., & Co., Presses, 26.
 Gossamer Rubber Co., 59.
 Goulding, Johnston, & Co., Machinery, 19.
 Goyard, L., 93.
 Goyard, F., Crucibles, 46.
 Graham, J. S., & Co., Wood Mach., 18.
 Graf, L., & Bro., Boots, 57.
 Graf, L., Machine, 60.
 Graff, F., Architect, 89.

- Grant, D. C., Plow, 39.
 Grant, G. B., Machines, 27.
 Gratz, Miss E., 79.
 Graves, L. S., Machines, 60.
 Gray, J. H., Machinery, 21.
 Gray, S. S., Scales, 36.
 Great American Brick Machine Co., 22.
 Gregg, I., & Co., Machinery, 22.
 Gregg, W. L., Machine, 22.
 Grenier, F., Boat, 45.
 Green, E., & Son, Economizer, 41.
 Greenwalt, J. & J. K., Leather, 61.
 Greene, Miss, Needle Work, 80.
 Greenwich Machine Works, 19; Governor, 31.
 Greenwood & Batley, Machines, 41.
 Greer, S. Y., Hose Carriage, 34.
 Grier, W. W., Ram, 28.
 Griffiths, J. W., Bending Machine, 18; Model, 39.
 Griffith & Wedge, Engine, 30.
 Griggs, H. W., Drawings, 35.
 Grimshaw, R., Fire Extinguisher, 33.
 Grinnell, I., Ice Yacht, 38.
 Griscom & Co., Machine, 37.
 Grootzinger, R., & Son, Leather, 62.
 Gross, S. W., M.D., 88.
 Grosvenor, J. A., Pump, 32.
 Grothe, H., Model, 48.
 Gruber, J. P., Gas Works, 18; Filterer, 32.
 Guild, J. F., Leather, 63.
 Guinet, Ant., & Co., Looms, 46.
 Guion, G. G., Leather, 63.
 Guèret Bros., Soda Water Machine, 47.
 Gumpel, C. G., Rudder, 42.
 Gunpowder Pile Driver Co., 33, 91.
 Gurley, Miss C., Desk, 82.
 Guynar, R. B., Boiler, 28.
 Gwynne & Co., Pumps, 41.
 Gwynne, J. & H., Models, 41.
 Haase, J. A., Clamps, 22; Shield, 34.
 Hacker, J. C., & Co., Pocket Books, 58.
 Haedrick, H. G., & Sons, Harness, 59.
 Haëff, G. & M., Belting, 51.
 Hagner Drug Milling Co., 17.
 Halderman, L., & Son, Stone, 96.
 Hale, S. J., Books, 81.
 Hamburg-American Steamship Co., 49.
 Hamburg-American Sewing Machine Factory, 48.
 Hamilton & Homer, Stone, 96.
 Hamilton, S. M., Kiln, 22.
 Hamilton Steeled Wheel Co., 37.
 Hamilton Tool Co., Lathe, 43.
 Hamilton Web Co., 57.
 Hamilton, G. A., Machinery, 21.
 Hammett, L. C., Rollers, 26.
 Haman & Dewees, Dies, 60.
 Hannahan, J., Bits, 42.
 Hansell, W. S., & Sons, Harness, 59.
 Hansen, C. A., Models, 53.
 Hanson, T., Pumps, 42.
 Hautin Sewing Machine Co., 60.
 Harbert & Raymond, Mill, 19.
 Harbor Master, Office of the, Models, 54.
 Hardenburg, Elmore, & Co., Leather, 61.
 Harding, Miss C., Embroideries, 80.
 Hardman, J. L., & Co., Belting, 44.
 Hardy Machine Co., 21.
 Hardy Patent Pick Co., 40.
 Harlan & Hollingsworth Co., Models, 39.
 Harley, E. G., Darner, 81.
 Harman, Mrs. E. F., Designs, 80.
 Harris, C. S., Machine, 37.
 Harris, Griffin, & Co., Meters, 18.
 Harris, S., & Co., Water-Wheel, 44; Car Wheels, 45; Capstan, 46.
 Harris, T., Needle Sharpener, 43.
 Harris, W. C., 86.
 Harrison Boiler Works, 28.
 Harrison, E., Mill Stone, 37.
 Harrison, S. L., Axles, 36.
 Harrison, W. H., Pump, 33.
 Harrold, G. W., Steam Trap, 28.
 Hart, P. W., Mill, 19.
 Hart, R., Machinery, 19.
 Hart, W. H., jr., Machine, 25.
 Hartford Governor Co., 31.
 Hartford Foundry & Machine Co., 30.
 Hartford Pump Co., 29.
 Hartford Steam Boiler Inspection & Insurance Co., 28.
 Hartness, J., Balloon, 38.
 Haskell, B. C., & Dickerman, Findings, 57.
 Hoskins Steam Engine Co., 28.
 Haubner & Heller, Skins, 62.
 Haughwout, E. V., Presses, 26.
 Haurey, H. F., Brushes, 31.
 Hawthaway, C. L., & Sons, Blackings, 56.
 Hawarth, J., Turbines, 28.
 Hawley, H. Q., Motors, 29.
 Havens, W. H., Tables, 18.
 Haverkamp, B., Machines, 51.
 Hayes & McIvor, Architects, 97.
 Haynes, T., & Sons, Pumps, 41.
 Hazlehurst, S., Moulds, 22.
 Heap, J., & Co., Machines, 40.
 Heard & Sons, Architects, 95; Designs, 96.
 Heck, Mrs. J. M., 79.
 Hedlund, J., Sewing Machines, 51.
 Heim, A., Belting, 30.
 Helweg & Co., Boots, 57.
 Hemmer, L. P., Machine, 48.
 Hench, A. L., Leather, 61.
 Hench, G., Leather, 61.
 Henderson Hydraulic Car Brake Co., 36.
 Henry, Prof. J., 65.
 Henshaw, E., Tools, 58.
 Herold, D., Canoes, 45.
 Hermann, G., Machines, 48.
 Heshinjsen, W. F., Railroad Switch, 51.
 Hesser, Mrs. C. F., Stand, 82.
 Hessler, H., Leather, 62.
 Heubel, Miss M., Picture, 81; Wax-work, 84.
 Heulings, A., Ice Creeper, 57.
 Hewett & Follensbee, Machines, 23.
 Hewitt, W., Models, 51.
 Hewkesurrt, D. D., Spark Arresters, 45.
 Hey, H. T., Gauge, 23.
 Hey, M., Pump, 34.
 Hibblee, A. T., Model Dingle, 45.
 Hibernia Tannery, Leather, 61.
 Hickok, W. O., Machines, 26.
 Hidden, E. S., Leather, 60.
 Hill & Clark, Hooks, 42.
 Hill, J., Cotton Can, 24.
 Hill, J. R., & Co., Harness, 59.
 Hill, Mrs. W. J., 79.
 Hilles & Jones, Drills, 21.
 Hillman, L., Machine, 24.
 Hichliffe, R., Plates, 43.
 Hinkley, J., Sweeper, 25.
 Hirst, Miss C. R., Painting, 82; Easel, 82.
 Hitchcock, S. S., Scales, 36.
 Hoadley Co., J. C., Engines, 28.
 Hock & Co., Engines, 49.
 Hocker, G., Boots, 57.
 Hodgman, A. D., Machinery, 20.
 Hoffman, A. O., Limestone, 95.
 Hoffman, J., Leather, 61.
 Hoffman & Hoyt, Presses, 27.
 Holcomb, S. N., Hair Work, 84.
 Holland Manufacturing Co., Machines, 23.
 Hollinger, A., Leather, 62.
 Hollingshead, Miss H., Casket, 82.
 Holmes, E. & B., Machinery, 19.
 Holmes, J. E., Engine, 40.
 Holstein, A., Leather, 62.
 Holyoke Machine Co., 24.
 Holzer, W., Machinery, 22.
 Homans, Miss S. E., Painting, 83.
 Home Knitter Co., 25.
 Hook, G., Yacht, 38.
 Hooker, Mrs. W., 79.
 Hooker, Wm. D., Pumps, 32.
 Hoole, J. R., Perforator, 27.
 Hoopes, E. C., China, 80.
 Hoopes & Townsend, Bolts, 22.
 Hope & Co., Engraving Machine, 23.

- Hopkins, F. J., Painting, 83.
 Horn, W. H., & Bro., Tools, 59.
 Horstmans Bros., Belting, 50.
 Horton, Crary, & Co., S. I. Leather, 61.
 Horton, E., Son, & Co., Lathes, 21.
 Horton, G. B., & Co., Leather, 61.
 Hosmer, Miss H. S., Sculpture, 81.
 Hotchkiss, J., Machine, 22.
 Houghton, R. J., Scale Preventer, 28.
 House & Davidson, Doors, 96.
 Houston, Smith, & Co., 19.
 How, G. C., Slippers, 58.
 How, M., Shoes, 58.
 Howard, G. C., Grindstone Box, 24; Machines, 24; Press, 24; Plate Press, 26; Gearing, 30; Hoisting Machine, 33.
 Howard, J. H. & A. P., Leather, 61.
 Howard Manufacturing Co., Mitering Machine, 19.
 Howard Safety Boiler Manufacturing Co., 28.
 Howell & Bros., Machine, 16.
 Howell, T. P., & Co., Leather, 63.
 Howes, Babcock, & Co., Machines, 37.
 Howe Machine Co., Sewing Machine, 25; Boot and Shoe Sewing Machine, 60.
 Hoyt Brothers, Leather, 61.
 Hoyt, J. B., & Co., Belting, 30, 61.
 Hubbard & Aller, Pumps, 32.
 Hubbard, Miss L., Lace, 80.
 Hubbard, M. G., Sketch, 83.
 Hubbard & North, Leather, 61.
 Hudson, Mrs. A., Lace, 80.
 Huffer, A., Pump, 32.
 Huffman, W., Limestone, 96.
 Hughes, Mrs. L. C., 79.
 Huhn, H., & Co., Needles, 48.
 Hull & Belden Co., Hammer, 20; Mach., 25.
 Hummel, G. W., & Co., Leather, 63.
 Humphrey Bros., Machine, 25.
 Hunt, C. W., Vessel Unloader, 17, 91.
 Huntington Machine Works, 19.
 Hurd, F., & Co., Shovel, 40.
 Hurkamp, J. G., Sumac, 60.
 Hurst, I. R., Sandstone, 95.
 Husqvarna Arms Manufacturing Co., Sewing Machines, 51.
 Hussey, C. A., Engines, 29.
 Huston, Mrs. A. B., Embroideries, 81; Frame, 82; Mantel, 82.
 Huston, R. W., Pins, 26.
 Hutchinson, P. C., Anchor, 39.
 Hydrostatic & Hydraulic Co., Pump, 32.
 Imperial Manufacturing Co., Machines, 18.
 Imp. Steiner Gas Machine Co., 18.
 Industrial Paint, Varnish, and Filler Works, 17.
 Ingersoll Rock Drill Co., 17.
 Ingersoll & Balston, Press, 23.
 Ingham, J., & Sons, Shuttles, 40.
 Ingraham & Beard, Scourer, 37.
 Inman Steamship Co., 42.
 Innes, A., Leather, 61.
 Ipanema Iron Works, 54.
 Isaacus & Jacobsson, Architects, 85.
 Jacob, C. M., Cushions, 47.
 Jaeger, G. L., Machine, 27.
 James, Mary J., Table, 85.
 James, M. J., Painting, 83.
 Janvier, M. R., Curiosities, 81; Bird, 84.
 Jarecki Manufacturing Co., Brass Work, 35.
 Jeffery, T. B., Engines, 30.
 Jenkins, Mrs. R. E., Shoes, 81.
 Jenkins, Rear Admiral T. A., 65.
 Jenkins, W. H., & Co., Feeder, 31.
 Jenks, A. S., Bits, 59.
 Jeremias, T., Flowers, 84.
 Jersey City Iron Works, 37.
 Jersey City Wheel Foundry, 37.
 Jewell, Hon. M., 65.
 Jewell, P., & Sons, Belting, 30.
 Jewett & Keating, Leather, 62.
 Johns, H. W., Abestos, 24.
 Joint Stock Soc. for the Man. of Mach. and Tools, 50.
 Joliot, S., Car Brakes, 47.
 Johnson, H., Fancy Articles, 84.
 Johnson, N. M., Boots, 56.
 Johnson, Misses H. & M., Bedstead, 81; Frame, 82.
 Johnson, W., Lathe Chuck, 23.
 Johnson, L., & Co., Shoes, 58.
 Johnson, Clark, & Son, Machines, 25.
 Jones, C. C., Pump, 44.
 Jones, Mrs. D. D., Afghan, 81.
 Jones, J. McA., Boat Detacher, 38.
 Jones, F., & Co., Boots, 57.
 Jones, Mrs. M. A., Clothing, 80.
 Jones, W., & Co., Leather, 63.
 Jones & Burland, Springs, 44.
 Jones & Holmes, Elevators, 33.
 Jones & Laughlins, Iron, 30.
 Jones, Lauson, & Co., Lathes, 20.
 Jordon, Miss L. B., Cabinet, 82.
 Judkins, Miss E. M., Paintings, 84.
 Jullien & Jennar, Vise, 50.
 Kaika, Hugh, Architect, 85, 88, 89, 92, 93, 95, 98.
 Kahlke & Detlassen, Machinery, 48.
 Kampmann, Mrs. L., Hair Work, 84.
 Karr, E. F., Architect, 98.
 Kasson, W. M., 88, 90, 99.
 Keen & Coates, Leather, 60.
 Keiper, H., Leather, 61.
 Kelley, W. E., Boiler, 28; Pumps, 32.
 Kelley & Moore, Shoes, 57.
 Kelsey, W. A., & Co., Presses, 26.
 Kemper, Mrs. T., Tray, 82.
 Kennedy, D., Tools, 21.
 Kennedy, E., Ash Pan Cleaner, 45.
 Kennedy, W., & Son, Planer, 42; Water Wheel, 43.
 Kenny & McPartland, Shoes, 57.
 Kenyon, J. A., & Co., Leather, 61.
 Kerr, N. M., & Co., Boxes, 27.
 Kessler & Bro., Harness, 59.
 Keyser, Mrs. E., Clothing, 80.
 Keystone Portable Forge Co., 20.
 Kidd, Mrs. N. R., Stand, 82.
 Kiefel, Stiefel, & Co., Leather, 62.
 Kiehle, R., Machines, 48.
 Kilsheimer, F., Boots, 57.
 Kimball & Morton, Sewing Machines, 41.
 Kimberley, N. G., Mills, 40.
 King, C. W., Pumps, 32.
 King, Mrs. H., Shawl, 80.
 King, W. H., Press, 17.
 Kinley, A., Leather, 61.
 Kirk, G. R., Lubricator, 34.
 Kirn, H., Architect, 92.
 Kitson Machine Co., 23.
 Klautscheck, Thomas, & Stuart, 87.
 Klein, C. C., Engine, 30.
 Klein, Hansen, & Co., Belting, 52.
 Klinghammar, T., Fish-scale Flowers, 84.
 Kline, A. K., Governor, 31; Coupler, 36.
 Klippart, J., Painting, 83.
 Knapp Dove-tailing Machine Co., 19.
 Knickerbocker Ice Co., 35.
 Kness, C., Leather, 56.
 Knolt, Car Tenders, 44.
 Knowles & Bro., Looms, 23.
 Knowlton & Dolan, Wheel, 29.
 Knox, D., Machine, 60.
 Koenigsberg, J., Oven, 17.
 Koine & Currie, Harness, 59.
 Kopings Machine Manufacturing Stock Co., Turning Mach., 51; Cylinder, 52; Axles, 52.
 Kockums Machine Mfg. Co., Models, 52.
 Kreider, Campbell, & Co., Paint Mills, 17; Lathe, 21; Engine, 28; Grain Mill, 38.
 Krumbhaar, A., Files, 22.
 Kuenhold, F. B., Hardware, 59.
 Kuh, S., Weaving Machine, 24.
 Ladies' Centennial Committee, Needlework, 80; Screen, 80; Paintings, 83; Carvings, 82.
 Lafferty, H. W., & R., Drainer, 37.
 Lafler, J. A., Moulds, 22.
 La France Manufacturing Co., Engines, 32.

- Lagowitz, J., & Co., Trunks, 58.
 Lahays, J. J., Cars, 36.
 Laidley, T. T. S., Architect, 66.
 Laird, Schober, & Mitchell, Boots, 57.
 Lalance & Grosjean M'fg Co., Generators, 34.
 Lamb Knitting Machine Manf'g Co., 24.
 Lamm, J., Extinguishers, 34.
 Lammertz, L., Needles, 48.
 Lambert, H., Hide Worker, 60; Leather, 62.
 Lambert, P. W., & Co., Pocket Books, 58.
 Lancaster, W., Loom, 40.
 Landis, Mrs. D. C., Painting, 83.
 Lane Manufacturing Co., Mills, 18; Water-Wheel, 28.
 Lane, Jenkins, & Sons, Shoes, 58.
 Lane & Bodley, Mortisers, 18; Mill, 19.
 Lang, W. Bailey, & Co., Tires, 36.
 Lang & Wanner, Leather, 62.
 Langfeld, J., & Sons, Pocket Books, 59.
 Lapham, H. G., Leather, 61.
 Lapiere, Z., Boats, 45.
 Lappe, J. C., Leather, 62.
 Lappe & Hax, Leather, 62.
 La Quintinie, A., & Co., Tools, 46.
 Larrabee, E., & Sons, Leather, 63.
 Laruc, H., Separator, 42.
 Lascole, A., Gas Apparatus, 46.
 Lathrop Anti-Frictionate Co., Sewing Machine, 25; Lubricator, 31.
 Lauber, P. J., 98.
 Lavers, A. H., Machinery, 40.
 Lawlor, J. D., Machines, 43.
 Laws, Miss L. T., Stand, 82.
 Lawson, S., & Sons, Spinning Machinery, 41.
 Lawrence, F., Cupola, 20.
 Lawrence, J. H., Leather, 62.
 Lawrence & Co., Refrigerators, 42.
 Laurenus, Engberg, & Co., Engine, 52.
 Leas, W. B., Leather, 61.
 Leas, McVitty, & Sons, Leather, 60.
 Le Bas, Clutch, 47.
 Lecerf, L., Printing Materials, 47.
 Lee, W. C., Leather, 61.
 Leffel, J., & Co., Wheel, 29.
 Legart, D., Machine, 46.
 Legrand, A., Sleepers, 50.
 Leh, H., & Co., Boots, 57.
 Lehigh Valley Emery Wheel Co., 21.
 Lehman, Architect, 93.
 Lehman, B. E., Gauges, 31.
 Lejeune Gas Charger, 47.
 Lent, A. E., Press, 26.
 Leonard, F. L. J., Railway Brake, 50.
 Leonard & Silliman, Spindles, 24; Grain Elevator, 33; Grist Mills, 37.
 Leroy, F., Models, 47.
 Lesofors Stock Co., Cables, 52.
 Le Van, W. B., Governors, 31.
 Levi & Berg, Blacking, 56.
 Levy, C., & Co., Engine, 44.
 Lewis, R. S., Ironer, 25.
 Libotte, N., Cages, 50.
 Lidgerwood Manufacturing Co., Engines, 29.
 Leinard, Col., Designer, 93.
 Lighthouse, J. C., Collars, 59.
 Lilly, J., & Co., Printing Presses, 41.
 Lilly, Young, Pratt, & Brackett, Boots, 57.
 Limit, Lapareille, & Co., Files, 46.
 Linderman, Mrs. S., Paintings, 83.
 Linfoot, B., Machine, 26.
 Lion & Guichard, Manometer, 47.
 Lippincott, C., & Co., Soda-water Apparatus, 34, 90.
 Livingston, L. M., Cutting, 80.
 Lobdell Car Wheel Co., Rivet Machine, 20; Callender Rolls, 24; Engine, 29; Car Wheel, 36.
 Lookwood, F. A., Machine, 60.
 Lockwood, W. E. & E. D., Machines, 27.
 Loeff, P., Model, 48.
 Logan, J. M., Model, 42.
 Logette, Clasps, 47.
 Loiseau, E. F., Pressed Fuel, 93.
 Loke, Mrs. C., Embroidery, 84.
 Lonergan & McBride, Cups, 31.
 Long, Mrs. E. C., 79.
 Long, Dennis, & Co., Pipes, 35.
 Lordley, Howe, & Co., Lathe, 43.
 Loth, F., Machinery, 48.
 Lovejoy, Mrs. C. P., Leaves, 84.
 Lovegrove & Co., Machinery, 20; Boilers, 28; Engine, 29.
 Low, David W., Ice Crushers, 35.
 Lowe & Watson, Boiler, 28.
 Ludeling, Mrs. M. C., 79.
 Ludlow Valve Manufacturing Co., 35.
 Ludy, C., & Sons, Skins, 62.
 Lunkenheimer, F., Lubricators, 35.
 Lyall, J. & W., Looms, 24.
 Lyford, S. C., 65.
 Lyman, A. E., & Wife, Gummer, 19; Packing, 31.
 Lyman, W. S., & Co., Machines, 42.
 Lynch, A., Harness, 59.
 Lynde, J. D., Boiler, 28; Engine, 30; Governors, 31.
 Mabile, V., Railway Stock, 50.
 Macabies, Feeder, 47.
 Maccrellish, Mrs. F., 79.
 Macdaniel, Miss F. L., Pressed Flowers, 84.
 Macdermott, M., Wedge, 40.
 Macdonald, C. F., 65.
 Mackellar, Smiths, & Jordan, Machinery, 27.
 Mackenzie, D., Reader, 40.
 Macomb, H. A., 87.
 Maigrou, F. A., Machine, 46.
 Maldine, H., Soda-water Machines, 47.
 Malleable Iron Fittings Co., 20.
 Manheim, W., Loops, 59.
 Manning & Lyon, Winkers, 59.
 Mann, W. H., Machine, 26.
 Mansfield Machine Works, 29.
 Mapleton Tannery, 61.
 Mardof, C., Leather, 62.
 Marengo, J. & A., Cigarette Machine, 45.
 Marquis, F. H., Models, 45.
 Marin, C., Machine, 24.
 Marsh, P. C., Sail-reefer, 45.
 Marshall, T. J., & Co., Paper Machinery, 41.
 Marshall, C., Women's Medical College, 81.
 Marston, J. M., Machine, 18.
 Martin, J. C., Machine, 17.
 Martin, H., Machine, 22.
 Martin, Claude, Anchors, 42.
 Martin, Christopher, Engines, 44.
 Martin, Celestin, Looms, 50.
 Martin, T. J., Cards, 50.
 Martin & Riedle, Leather, 62.
 Martin, Mrs. J. H., Flowers, 81.
 Martin, Mrs. E., Paintings, 84.
 Mason, V. W., & Co., Pulleys, 30; Machine, 33.
 Mason, J. S., & Co., Blacking, 56.
 Mass. Commission, Models, 38.
 Massey, B. & S., Hammers, 40.
 Mathien, C., Engine, 22.
 Matsuo-Ehe, Architect, 88, 95.
 Matthews, J., Soda-water Apparatus, 34.
 Maurice, Widow, & Guenin, Bottling Machines, 47.
 Mauser & Haid, Stone, 96.
 Mayer & Stern, Shoes, 57.
 May, Withey, & Drake, Machine, 60.
 McCaffrey & Bro., Files, 22.
 McCarthy, Miss E., Piano Cover, 81.
 McCausland, J., Machinery, 24.
 McClintock, J. R., Pavement, 17.
 McCloskey, Miss L., Frame, 82.
 McClure, A. K., 86.
 McCollum, L. A., Machine, 38.
 McCutcheon, J. F., Engine Block, 30.
 McDermott, J., & Co., Stone, 96.
 McDonald, I., & Co., Wheels, 45.
 McDowell, Miss W. H., Stand, 82.
 McEachern, J. D., Machines, 42.
 McFadden, P., Harness, 59.
 McFarlan, Thum, & Co., Drill, 43.
 McGilvery, S. W., Ship, 38.

- McHenry, Miss, 79.
 McKecknie & Bertrand, Lathes, 43.
 McKee, Fuller, & Co., Wheels, 35.
 McKinstry & Childs, Leather, 61.
 McKeough, J. W., Brass Dome, 44.
 McKay, A., Model, 43.
 McKay, J., Barley Machine, 45.
 McKay Sewing Machine Ass'n, 60.
 McLean & Bannor Brick Machine Co., 22.
 McLean & Bannor Machine Co., Sewing Machine, 25.
 McLaughlin, Miss M. L., Bust, 81; Panels, 83.
 McMartin, J. A., Pump, 44.
 McNab & Harlin Mfg. Co., Valves, 31.
 McNair, L. H., Marker, 81.
 McNally, W. G., Coat of Arms, 95.
 McNeal & Black, Leather, 61.
 McNeely & Co., Leather, 63.
 McPherrin, H. E., Wax Work, 84.
 Meeker, D. M., & Sons, Cylinder, 30.
 Megy, Echevarria, & Bazan, Elevators, 47.
 Meissner, J. H., Grates, 28.
 Mellor & Orum, Machine, 18.
 Melvin & McMorris, Well, 17.
 Mendelson, O. & J., Fire Escape, 52.
 Menon, Mrs. M., Paintings, 84.
 Menzies, Miss R. N., Bracket, 82.
 Mercer, E., 98.
 Merchant & Co., Brass, 35.
 Meredith, Mrs. L. P., Decorations, 83.
 Merrill, C., & Sons, Hammer, 20.
 Merrill & Keiser, Gauge, 35.
 Merrill, Miss S., Stand, 82.
 Merriman, A. H., Machinery, 20.
 Merriman, C. S., Life-Saving Dress, 38.
 Merritt, A., Boat, 45.
 Mervine, S. P., jr., Regulator, 18.
 Mester, A. de, Bottling Machine, 47.
 Metallic Brush Co., 31.
 Metcalf, Miss F., Shield, 82.
 Metz, G. W., & Sons, Bellows, 20.
 Meyer, H. C., & Co., Washers, 34.
 Meyers, F., Scales, 36.
 Meyer, F. W. A., Drawing, 44, 46.
 Meyer, C. A. A., Boots, 57.
 Meyer, R., Skins, 63.
 Mitchell, A. M., Leather, 62.
 Michelot, jr., Cases, 47.
 Middleton, J. W., Iron, 19; Engines, 29.
 Middleton, N. & A., & Co., Springs, 36.
 Midvale Steel Works, 19, 36.
 Mignon & Rouart, Gas Motors, 47.
 Miles, W. A., Wheels, 36.
 Miles, G. W., Boat, 48.
 Mills, Thomas, & Bro., Freezers, 35; Machines, 37.
 Miles, C. P., Pumps, 44.
 Miller's Falls Co., Saws, 21.
 Miller, S. P., & Son, Tools, 22.
 Miller, McCullough, & Ober, Boots, 57.
 Miller, T. L., Machines, 60.
 Miller, J. & J., & Co., Leather, 62.
 Miller, J., 89.
 Miller, L. C., Architect, 97.
 Miltimore Car Axle Co., 36.
 Minas Gerais, Province of, Tools, 54.
 Minor, Mrs. K. S., 79.
 Mirlees, Tait, & Watson, Machinery, 42.
 Mitchell, J. E., Grindstones, 20.
 Mitchell, J. H., Boxes, 21; Engines, 30; Deck Pump, 32; Grater, 37.
 Mitchell, J. M., Machinery, 23.
 Mitchell & Taple, Machine, 42.
 Mitchell, R., & Co., Machine, 43.
 Mitchell, Mrs. C., Bureau, 80.
 Mitchell, Mrs. N. D., Painting, 83.
 Mitchell, D. G., Architect, 97.
 Mittweida Carder Factory, 48.
 Moberg's Machine Manufacturing Co., 52.
 Moffat, D., & Co., Leather, 62.
 Mohawk & Hudson Manufacturing Co., Hydrants, 34.
 Molyneux, J. B., Folder, 27.
 Moncrieff, J., Gauges, 41.
 Mondolot, A., Soda-water Machines, etc., 47.
 Monk, C., Tools, 22.
 Montani, Pierre, Architect, 92.
 Montgomery, R. M., Sandstone, 96.
 Moore & Richie, Machinery, 19.
 Moore, T., Collars, 59.
 Moore, Miss A. G., Stand, 82.
 Moorehouse, R. O., & Co., Engine, 29.
 Moraill, M. J., Architect, 93.
 Morand, A., Machinery, 22.
 Morane, jr., Press, 47.
 Moreau, L., Fire Engine, 50.
 Morely, E., Models, 45.
 Morrill, O., & Co., Machine, 43.
 Morris, Tasker, & Co., Gas Works, 18; Metal Work, 34.
 Morris Co., J. P., Engine, 23.
 Morris, J. W., Signals, 45.
 Morrison, J., Gauges, 44.
 Morse Twist Drill & Machine Co., 22.
 Morthin, P., Model, 52.
 Morton, T., Balances, 36.
 Moseley, J. S., Machine, 18.
 Moseman, C. M., & Bro., Harness, 59.
 Mosler, G. J., Wheel, 46.
 Mosser, W. F., & Co., Bark Mill, 25; Wheel, 29.
 Mosser & Keck, Leather, 61.
 Motala Machine Manufacturing Co., Boat, 52.
 Mott Iron Works, 35.
 Motts, G., Harness, 59.
 Moulded Heel Stiffening Co., 58.
 Mountain, Mrs. H. B., Mattress, 80.
 Mower & Bro., Boots, 58.
 Mower, F. B., Boots, 58.
 Moy, T., Steam Engines, 41.
 Moyer, E. P., & Bros., Harness, 59.
 Mudge, E. & A., & Co., Shoes, 58.
 Mudge, W. R., Leather, 58.
 Müller, C., Machines, 48.
 Muller & Co., Safety wicks, 50.
 Murphy, F., Ventilators, 33.
 Murphy & Harle, Fire Extinguisher, 44.
 Murphy, Lymans, & Co., Pulley, 44.
 Murphy's Sons, W. F., Machine, 27.
 Murrill & Keizer, Regulator, 28.
 Museum of Bergen, Models, 53.
 Mussot, A., Machinery, 19.
 Myers, S., & Son, Drill, 43; Blower, 44.
 Nachly & Bros., Architects, 94.
 Nashua Iron & Steel Co., 37.
 National Hat Pouncing Machine Co., 25.
 National Leather Co., 63.
 National Needle Co., 26.
 National Rubber Co., 59.
 National Scale Co., 36.
 National Suspender Co., 25.
 National Tube Works Co., 34.
 National Water-Wheel Co., 29.
 Natt, P. D., Painting, 83.
 Naval Estab. of Carl Johansvaern, Models, 53.
 Naval Arsenal, Steam Engine, 54.
 Navy Yard, Ship Building Wood, 54.
 Naylor, Jacob, Engines, 30.
 Nelson & Co., Pipe, 43; Propeller Wheel, 44.
 Nelson, N., Brakes, 36.
 Nepper, E. & D., Leather, 62.
 Neuss, H. F., Needles, 48.
 Neut, L., & Dumont, L., Pumps, 47.
 Newbold, R. S., & Son, Shear, 21.
 Newberry, A. & B., Press, 26.
 Newcomb & Walker, Shoes, 57.
 Newell, Miss E., Plate, 82.
 Newell, W. H., Valves, 31.
 Newton, Wilson, & Co., Sewing Machines, 41.
 New England Co., Spooler, 24.
 Newkumet, A., Machinery, 22.
 New Brunswick Rubber Co., 59.
 N. J. Car Spring & Rubber Co., 30, 34, 36.
 New York Belting and Packing Co., 31.
 New York Manufacturing Leather Co., 62.
 New York Mills, Machinery, 23.

- New York Needle Co., 25.
 New York Safety Steam Power Co., 30;
 Steam Launch, 39.
 New York Tribune, 93.
 Niagara Steam Pump Works, 30.
 Niblock, Zimmerman, & Alexander, Cutter,
 17.
 Nicaise, Ch., & Co., & Gobert, Machinery,
 50.
 Nichols, Pickering, & Co., Punches, 20;
 Springs, 36.
 Nichols, B. S., & Co., Engine, 34.
 Nichols, G. H., & Co., Boots, 58.
 Nicholson File Co., 23.
 Nilson, G., Jacks, 51.
 Nilsson, N. W., Couplings, 52.
 Noback Bros., & Fritz, Models, 49.
 Noble, C., & Co., 92.
 Nonotuck Silk Co., Machinery, 23.
 Noot, L., Laces, 80.
 Norris, W. R., Machine, 18.
 Northampton Emery Wheel Co., 21.
 Norwalk Iron Works Co., Pumps, 32.
 Novelty Gas Machine Co., 18.
 Novelty Paper Box Co., 27.
 Noye, J. T., & Son, Tools, 37.
 Noyes, Mrs. E. F., 79.
 Noyes, F. G., Edger, 19.
 Nunn, W. C., Signals, 45.
 Nussey & Leachman, Machinery, 40.
 Nye, Gourley, & Co., Pump, 32.
 Oakley & Keating, Machine, 25.
 Oakville Manufacturing Co., Pumps, 44.
 O'Callaghan, F. O., Skins, 63.
 Ohio Falls Oak Leather Co., 60.
 Ohio Stone Company, 96.
 Jacobsen's, O., Mechanical Works, Mangle,
 52.
 Oldenborgh, Mrs. M. J., Wax Roses, 84.
 Oliver, F. H., Models, 45.
 Oliver, J., Models, 45.
 Oneida Steam Engine & Foundry Co., 21.
 O'Neil, A., Pipes, 35.
 Oppenheimer, J. D., Machinery, 24.
 Ordway, A., Tobacco Manufacturing, 38.
 Ordway & Clark, Boots, 58.
 Origone, P., Models, 53.
 Orum, M. L., Mandrels, 23.
 Osborne, F., jr., & Co., Leather, 62.
 Osborne, C. S., & Co., Tools, 59.
 Osenbrück & Co., Lubricators, 48.
 Osgood, J. A., Oiler, 31.
 Osgood, H., M.D., 88.
 Ostrand, H., Drawing, 52.
 Osterhout, W. H., Leather, 61.
 Otis, Bros., & Co., Engine, 30; Elevator, 33.
 Overend, Miss R. C., Muff, 80.
 Pack, Miss M. L., Secretary, 82.
 Packer, C. W., Machine, 27.
 Packert, C. D., & Co., Shoes, 58.
 Page, E. W., Oars, 38.
 Page, W. H., & Co., Type, 27.
 Page Belting Co., 30.
 Page, Mrs. E. M., Catcher, 80.
 Paget, Miss N., Needlework, 80.
 Pahlman, S., Embroidery, 84.
 Paillet & Co., Corks, 47.
 Palmer, Miss H. M., Cover, 80.
 Palmer, St. G. H., Equipments, 58.
 Palmer & Decker, Leather, 61.
 Palmer Europ. Pat. Tent. & Fin. M. Co., 23.
 Pancoast & Maule, Radiators, 31.
 Papper, J. & D., Boiler Preserver, 49.
 Paresi, E. G., Furnace, 53.
 Parker, Mrs. M. E., Screen, 80; Shawls, 81.
 Parker, C., Vises, 22.
 Parks, J. A., Presses, 26.
 Parks & Woolson Machine Co., 24.
 Pastor, P. H., Sons, Needles, 48.
 Paterson Steam Fire Engine Works, 34.
 Patrick, R., Pump, 44.
 Paul, J., & Co., Sandstone, 96.
 Payne, B. W., & Sons, Engines, 28.
 Pearson, M., Machine, 25.
 Pease, F. S., Pump, 32.
 Pease, J. H., Railway System, 35.
 Peet Valve Co., 35.
 Peirce, C. D., Borer, 17.
 Peirce, M. P., Wheel, 29.
 Pelouze, E., & Audouin, P., Condenser, 46.
 Penniman, Miss E. A., Painting, 83.
 Pennsylvania Combined Iron & Steel Assoc.,
 39, 39.
 Pennsylvania Diamond Drill Co., 17.
 Pennsylvania Railroad Co., Locomotive, 35.
 Pennsylvania Railroad Co., 91.
 Pennsylvania Steel Co., 37.
 Pepper, W., M.D., 87.
 Perisi, A., & Son, Machine, 51.
 Perreux, L. G., Valves, 47; Propeller, 47.
 Perret, M., Fire Apparatus, 46.
 Perry, F. H., & Co., Leather, 62.
 Peters, H. J., Car, 44.
 Peters & Barger, Architects, 83.
 Peters & Caloun Co., Harness, 59.
 Petener, B. J., Boot & Shoe Machinery, 43.
 Pettit, H., Architect, 99.
 Pettit & Wilson, Architects, 90, 91.
 Pusey, Jones, & Co., Machine, 59.
 Pfeiffer, C., Architect, 98.
 Phila. & Reading R. R. Co., Locomotive, 35.
 Phillips, C. C., Architect, 92.
 Phillips, E. B., Indelible Ink, 83.
 Phoenix Iron Works, 42.
 Pickering, J., Hoists, 40.
 Pierce, Mrs. M. R., Stands, 84; Bank, 81.
 Pierron & Dehartre, Weaver, 46.
 Piper, T., Sewing Machine, 43; Steam Gauge,
 44; Model Machine, 44.
 Pitman, Miss A., Secretary, 82; Chest, 82;
 Piano, 81.
 Pitman, Mrs. A., Cabinet, 82.
 Pitman, Mrs. & Miss, Carved Door, 81;
 Shelves, 82.
 Pitts, D. H., Submarine Armor, 44; Clamp,
 46; Windlass, 46.
 Planet Mills Manufacturing Co., Loom, 23.
 Plate, Sam., Mill Stones, 45.
 Platt, W. K., & Co., Fire Extinguishers, 33.
 Platt Bros. & Co., Gin, 40.
 Plumb, Burdick, & Barnard, Forge, 22.
 Plummer, W. E., Machine, 60.
 Poillon, C. & R., Models, 38.
 Pool, A. A., & Co., Steel Arbors, 23.
 Poole, J. M., & Co., Machines, 23.
 Poole & Hunt, Fertilizer, 17; Wheel, 29;
 Shafting, 30; Heater, 32.
 Poor, H., & Son, Leather, 62.
 Pope Manufacturing Co., 19.
 Popham, E., Peg Breaker, 43.
 Porter, Bell, & Co., Locomotive, 35.
 Post & Co., Gauges, 31.
 Postens, E., Soda-water Apparatus, 34.
 Potter, C., jr., Co., Presses, 26.
 Pounds, W. H., Brass Works, 35.
 Power, W., & Co., Models, 45.
 Powers, S. H., Loom, 43.
 Prakke, J. E. & H., Belting, 51.
 Pratt, J., Machine, 27.
 Pratt Manufacturing Co., Elastic Joints, 37.
 Preble, Miss M., Paintings, 83.
 Prentice & Co., Lathes, 20.
 Price, Lipsett, & Co., Scales, 36.
 Prichard, Smith, & Co., Boots, 57.
 Procope, M., Sewing Machine, 51; Leather,
 63.
 Procter, T. E., Leather, 62.
 Proser, T. T., Machine, 60.
 Prouty, A. B., Jaws, 21; Machine, 23.
 Providence Machine Co., 24.
 Providence Steam Engine Co., Models, 39.
 Provincial Commission, Oars, 54.
 Prowse Bros., Fire Extinguisher, 44.
 Puffer, A. D., Beer Apparatus, 34.
 Pulsey, Scott, & Co., Morocco, 63.
 Putnam Machine Co., 21.
 Pyramid Pin Co., 26.
 Pyrotechnical Laboratory, 53.

- Quebec Advisory Board, Model, 45.
 Racine Hardware Manufacturing Co., 21.
 Radde, Wm., Pipe, 35.
 Raddin, J., Wheels, 37.
 Ramapo Wheel & Foundry Co., 6.
 Ramborger, A. D., Dental Work, 31.
 Ramsay, R. W., Truck Reliever, 45.
 Ramsey, E., Paintings, 84.
 Ramsey, R. H., Machine, 18.
 Rand, Mrs. W. S., 79.
 Randall, F. M., Pump, 33.
 Ransomes, Sims, & Head, Steam Engines, 41.
 Rappe, Baroness E., Frames, 84.
 Rardon, J. S., Button Holer, 25.
 Rath, E. E., Architect, 93.
 Raw, Dr. C., 73.
 Rawson & Hittinger, Engines, 28.
 Ray, D. P., sr., Leather, 61.
 Raymond, Machines, 43.
 Redifer, S. S., Lasts, 60.
 Reed, H., Tannery, 60.
 Reed, J. A., Boilers, 28.
 Reed, S. G., Heaters, 20.
 Reed, Mrs. W. G., 79.
 Reed, G. H., & Sons, Inks, 56.
 Reeves, J. W., Machine, 17.
 Reford, J. W., Distillery Apparatus, 38.
 Keilly, C., Scale, 36.
 Reinhardt, C., Scales, 36.
 Renard, Wires, 47.
 Renick, B. F., & Co., Press, 26.
 Rennes, D. W. Van, Sewing Machine, 51;
 Machine, 51.
 Requa, E. M., Model, 81.
 Restorff & Bettman, Polish, 56.
 Reversible Boot Heel Co., 60.
 Rex & Bockius, Generator, 18; Machine, 25;
 Presses, 26.
 Reynolds, S., & Co., Hardware, 59.
 Rice, Miss M., Frame, 82.
 Rice, Miss J. H., Table, 82.
 Rice, Barton & Fales Mach. and Iron Co., 24.
 Ridar Life Raft Co., 38.
 Rider, Wooster, & Co., Engines, 29.
 Ridge, E., Gates, 37.
 Rife, H. J., Leather, 61.
 Rigollot, Water-Cocks, 47.
 Riehle Bros., Machine, 18; Scales, 35.
 Riehle, M., & Sons, Cutter, 27.
 Rietschoten, Van, & Houwens, Model, 51.
 Rio Grande do Sul, Arsenal in Prov. of, 54.
 Rio de Janeiro, Army Arsenal at, Motor, 54.
 Rio de Janeiro, Military Archives of, 51.
 Rio de Janeiro, Navy Yard, Models, 54.
 Rippman, C. A., Leather, 61.
 Risdon, T. H., & Co., Wheel, 29.
 Richards, H. J., Yacht, 38.
 Richards, J. S., Machines, 46.
 Richards, M. C., Indian Work, 81.
 Richards, E. O., & Bro., Car Brakes, 45.
 Richards, Loudon, & Kelly, Machinery, 19.
 Richardson, D. M., Scourer, 37.
 Richelderfer, J. H., Gaiters, 57.
 Richelieu & Ontario Navigation Co., 45.
 Robbins & Kelloggs, Shoes, 58.
 Roberts, J., M. D., 7.
 Roberts, W., Machinery, 40.
 Robertson, D., Brick Machine, 51.
 Robertson, J., & Co., Pumps, 33.
 Robeson, Hon. G. M., 65.
 Robitaille, T., Boat, 45.
 Roby, G. W., Vessels, 42.
 Rockville Traverse Card Grinding Co., 23.
 Rockwell, J. S., & Co., Leather, 63.
 Rockwell Bros., Leather, 61.
 Rockwood, Mrs. W. O., 79.
 Roddey, P. D., & Co., Ventilator, 33.
 Roebbing's Sons, J. A., & Co., Rope, 30.
 Roed Works, Engine, 52.
 Rogers, W. A., Machines, 21.
 Rogers Locomotive and Machine Works, 35.
 Roibon, F., Model, 54.
 Rollins, E. A., 85.
 Ronald, J. D., Engines, 44.
 Ross, J. J., Brick Machine, 51.
 Rosts, P. H. & F. M., Blowers, 32;
 Tuyere, 35.
 Rose, A., Leather, 62.
 Rose, N., Models, 45.
 Rosenegger, J., Models, 49.
 Rosenheel, W. H., Model, 60.
 Rosenthal, W. H., Leather, 61.
 Rosenthal, I., Machine, 26.
 Ross, E., Boats, 45.
 Ross, L. E., Looms, 23.
 Ross, T., Machinery, 21; Crane, 33.
 Ross, E. W., & Co., Jointer, 19; Mill, 19;
 Paper Mill, 24, 91.
 Rous, E., Tools, 46; Clasp, 47.
 Rousseau's Railway Signal Co., 37.
 Rorer, T. I., Belting, 30.
 Rowe, G. A., Lathe, 20.
 Rowell, G. P., & Co., 93.
 Rowland, J. R., Brake, 35.
 Royal Centennial Commission, Models, 52.
 Royal Saxon Fire Extinguisher Co., 49.
 Royer, H., Belting, 30.
 Ruger, J. W., & Co., Machinery, 38.
 Rumsey, A., & Co., Leather, 62.
 Rumsey & Co., Pumps, 32; Engine, 34.
 Rumquist, C. R., Engine, 52.
 Ruoff, W., Jackscrews, 33.
 Russell, Burdsell, & Ward, Bolts, 23.
 Ruth, Mrs. S., Sunshade, 81.
 Ruthen, J., Machine, 42.
 Rutschmann Bros., Drill, 22.
 Ryan, J. M., Lathe, 21.
 Rider Reciprocal Grate Ass'n., 28.
 Safford, G. W., & Co., Presses, 26.
 St. Amand, O., Machine, 43.
 St. John Sewing Machine Co., 25.
 Sallada & Pearson, Whips, 59.
 Samuelson, S. H., Brick Machine, 51.
 Sample, McElroy, & Co., Engine, 28.
 Samson & Co., Models, 45.
 Samson, C., Stand, 43.
 Sanders, Mrs. J., 79.
 Sanson, R. B., Machines, 41.
 Santos, C. dos, Imperial Crown, 54.
 Sandvikens Iron Works Stock Co., 52.
 Sandvikens Iron Works, 51.
 Sartain, E., Paintings, 83.
 Saunders, W., 65.
 Sausser, Daugler, & Co., Shoes, 57.
 Sauter, C., Machines, 38.
 S. A. Woods Machine Co., 19.
 Sawyer, H., Crystal Blue, 56.
 Saxby & Farmer, Signals, 42.
 Sax & Kear, Wheels, 36.
 Scalas, R., Evaporator, 45.
 Schanz, C., Hook & Ladder Truck, 33.
 Schäffer & Budenberg, Manometer, 48.
 Schellberg, B. F., Leather, 60.
 Schimmel, Oscar, & Co., Machine, 48.
 Schlickeysen, C., Machinery, 48.
 Schmabh, F. G., Machine, 48.
 Schmid, J., Boots, 57.
 Schmiere, Werner, & Stein, Presses, 48.
 Schmitt, Mrs. K., Jewelry, 81.
 Schoellkopf, J. F., & Son, Leather, 62.
 Schollenberger, W., & Sons, Leather, 63.
 Schoem, W. H., Springs, 36.
 Schoff, W. L., Shoes, 57.
 School of Design, Metal Work, 81.
 Schon, M., Machine, 20.
 Schram, W., Jacquard Machines, 49.
 Schrieren, C. A., Belting, 30.
 Schultz, E., Atmospheric Apparatus, 49.
 Schuman, F., & Son, Leather, 62.
 Schutte & Goehring, Injectors, 31.
 Schwarzmann, H. J., Architect, 79, 85, 86,
 87, 88, 89, 92, 93, 94, 95, 97, 98, 99.
 Scofield, C., Machinery, 21.
 Scudder, Miss T., Cupboard, 82.
 Sears & Worner, Shoe Goods, 58.
 Seaton, W., Rail, 42.
 Segebader, H., Embroideries, 84.
 Seignuret, H. J., Power, 29.

- Sells, H., Mill, 44.
 Sellers, Wm., & Co., Hammers, 20.
 Sellers, W., & Co., Engines, 28.
 Semenety, R., Boots, 56.
 Semple, M. H., Cutter, 27.
 Stevens, Mrs. E. S., 79.
 Sewell, E. W., Canoe, 45; Drawing, 46.
 Seymour, F. J., Machinery, 21.
 Seymour & Whittock, Machinery, 19.
 Shaler, Miss M., Frame, 82.
 Shapleigh, Mrs. E. B., Rug, 80.
 Shapley & Wells, Engines, 29.
 Sharts, T., Irons, 22; Grate Bars, 28.
 Sharp, Tudor, & Co., Leather, 63.
 Shattuck & Binger, Skins, 62.
 Shaw, Mrs. E. F., Dress Protector, 25.
 Shaw, G. W., Wool Spinner, 24.
 Shaw & Gray, Balance, 35.
 Shaw, T., Lathe Tools, 23; Gauges, 27.
 Shaw, W., Printing Press, 41.
 Shearer, H., Machine, 40.
 Shepherd, Mrs. E. M., Lace, 81.
 Shepherd, F. H., Architect, 99.
 Sheridan, E. R. & T. W., Cutters, 27.
 Sherwood, A. S., Greaser, 80.
 Shiland, A., Machine, 26.
 Shilling, F. A., Engines, 48.
 Spiral Tubing Co., 23.
 Shive, Governor Co., Bookbinder, 27; Scales, 31, 35.
 Shriver, A. K., & Sons, Sole Leather, 61.
 Shore Bros., Pumps, 28.
 Short, J., Loom, 24.
 Shuster, J. T., Covering, 28.
 Shutt, D., Machine, 25, 26; Press, 26.
 Sidney, I. C., Architect, 86.
 Siebe & Gorman, Diving Apparatus, 42.
 Siemens, C. W., Models, 40.
 Silcott, Millikan, & Gold, Machine, 24.
 Silsby Mfg. Co., Pump, 32; Engines, 33.
 Silver Lake Co., Packing, 32.
 Silver & Deming Mfg. Co., Augers, 18; Drills, 22; Choppers, 38.
 Silvino, Tripodi, Tools, 54.
 Simon, E., & Bro., Trunks, 58.
 Simonds Manufacturing Co., Knives, 22.
 Simonds, N. J., Stiffenings, 57.
 Simpson, J. F., Trunk Lock, 58.
 Simson, Mrs. M., 79.
 Sims, J. P., Architect, 98.
 Singer Mfg. Co., Sewing Machines, 25.
 Skidmore, A. F. & G. C., Coilers, 19.
 Skinner & Wood, Boiler, 28.
 Slichal, F., Horse-shoes, 54.
 Slocum, Mrs. M. E., Protector, 84.
 Sluthour & Mintzer, Pumps, 32.
 Small & Fisher, Barrel Lifter, 44.
 Smark, J., Mortising Machine, 43; Drilling Machines, 43; Pumps, 44.
 Smith, Mrs. A. H., 79.
 Smith, C. D., Gauges, 28.
 Smith, D. S., Canoe, 38.
 Smith, D., Stokers, 40.
 Smith, Elliot, & Co., Leather, 61.
 Smith, H. B., Machinery, 19.
 Smith, H. F., Fountain, 44.
 Smith, J., & Co., Machinery, 24.
 Smith, J. B., & Co., Rasps, 60.
 Smith, J. & S., Machinists' Tools, 41.
 Smith, Mrs. J. G., 79.
 Smith, J. G., Engine, 44.
 Smith, O., & Bro., Presses, 20.
 Smith & Starley, Machines, 41.
 Smyth, Mrs. M. H., Embroidery, 81; Indelible Ink, 83.
 Snow, Miss E. R., 79.
 Snyder, H., & Co., Brush, 31.
 Snyder, W. B., Engine, 28.
 Soderqvist, R., Gas Machine, 51.
 Soderberg, M., Mantle, 84.
 Sollers, S. D., & Co., Shoes, 61.
 Sommerville, J. L., Leather, 61.
 Sonheur, A., Lamps, 50.
 Southwick, Miss E. B., 98.
 Souza, F. de, Fuses, 53.
 Spahn, E. P., Signals, 37.
 Spanogle & Pennabaker, Leather, 61.
 Sparre, J. Von, Model, 48.
 Spaulding, E., Leather, 62.
 Spawn, A. F., & Co., Supplies, 34.
 Spencer's Sons, Scales, 36.
 Spiral Tubing Co., 34.
 Spiral Elliptic Spring Works, 20.
 Spitzer, G. W., Fans, 58.
 Spafford, Mrs. J. H., Supporters, 80; Saddle, 81.
 Springer, Mrs. L. R., Wax Work, 84.
 Springfield Elbow Co., 21.
 Stacy Stone Dressing Machine Co., 21.
 Standard Laundry Machinery Co., 27.
 Standard Machinery Co., 27.
 Standard Steel Works, 36.
 Stansbury, Mrs. J. C., Lace, 81.
 Starr, J. W., & Son, Gas Works, 18; Castings, 25, 91.
 States, Mrs. E. J., Dresses, 80.
 Steam Generator Manufacturing Co., 27.
 Steam Stone Cutter Co., 21.
 Stearns, Mrs. A. B., Diagrams, 80.
 Stearn, Mrs. J., Card Receiver, 82.
 Steele Bros., Engraver, 22.
 Steele, Mrs. M. W., Toy, 80.
 Steigler, A., & Co., Leather, 62.
 Steigert, L., Machines, 28.
 Steinway & Sons, Pianos, 36.
 Stephens Patent Vise Co., 22.
 Stephens, M., Pipe, 35.
 Stephenson, M., Machine, 43.
 Sternbergh, J. H., Grinding Machine, 17; Machinery, 20.
 Sternberger, L., Machines, 25; Elevator, 33.
 Stevens, W. X., Shears, 20.
 Stewart, Ralph, & Co., Machines, 33.
 Stewart, J. P., Collars, 59.
 Stileman, R. T. H., Hydrants, 35.
 Stiles, Mrs. E. W., File, 80; Inkstand, 81.
 Stilwell & Bierce Manufacturing Co., Wheel, 29; Filter, 31.
 Stilwell & Pierce, Lathes, 26.
 Stimpson, E. B., Machine, 60.
 Stitt, Price, & Co., Limestone, 96.
 Stockwell, J. W., Tamper, 22.
 Stocking, L. S., Sandstone, 96.
 Stod, J. B., & Co., Leather, 60.
 Stokes & Parish, 90.
 Stone, L., Books, 81.
 Stoops, A. T., Machine, 60.
 Storrs, L. B., Machines, 26.
 Stout, Mills, & Temple, Water-Wheels, 28.
 Straub, A. W., & Co., Millstone, 37.
 Straw, E. A., Engine, 33.
 Stribley, Miss M., Frame, 82.
 Stribley & Co., Shoes, 56.
 Stridsberg & Bjork, Saws, 51.
 Studwell, Sanger, & Co., Leather, 62.
 Sudreau, P., 86.
 Suermouldt, Mrs., Embroideries, 84.
 Sugg, W., Burners, 40.
 Sulzer Brothers, Gearing, 49.
 Surahammars Works, Wheels, 52.
 Surber, I. J., Reeds, 49.
 Sutcliffe, J. S., Separator, 42.
 Sutherland, J. G., Patterns, 58.
 Swain, Fuller, & Co., Machines, 60.
 S. W. Jamison, Crimping Machine Co., 60.
 Swarzmayer, J., Machine, 38.
 Swasey & Warner, Meter, 33.
 Sweetzer, C. S., & Co., Boots, 58.
 Swift, Miss M. P., Desk, 82.
 Swiss Mfg. Co., Heating Apparatus, 49.
 Sykes, L., & Son, Bolts, 31.
 Taft, Hon. A., 65.
 Taft, J. C., Machine, 25.
 Tagleicht, K., Spark Guard, 49.
 Talhouet, Mrs. R., Embroideries, 84.
 Tait, F., Wheel, 29.
 Talman & Kohn, 95.
 Tandy, G. J., Boiler, 43.

- Taneyhill, F., Painting, 81.
 Tapley Heel Burnishing Machine Assoc., 60.
 Tardy, Mrs. C., Corset, 20.
 Target, J., Patterns, 57.
 Tatham & Bros., Machines, 43.
 Tatum, Miss L., Stand, 80.
 Taylor, J. F., Cotton Presses, 33.
 Taylor, R., Rail Joint, 45.
 Taylor, Hon. R. W., 65.
 Taylor, W. B. S., Tubing, 59.
 Tazzer, Miss A., Chair, 82.
 Teal, C. A. & W. L., Rolls, 21.
 Tebbetts, C. B., Shoes, 58.
 Temper, Miss M., Machine, 80.
 Temple, Mrs. O. H., Frame, 82.
 Thames River Worsted Co., Machinery, 24.
 Theberath, C. M., & Bro., Hardware, 59.
 Thermo-Electric Generator Co., 41.
 Thessier, F., Seltzer Water Apparatus, 47.
 Thierry, E. J., Shoes, 57.
 Thwait, C., Model, 39.
 Thomas Extract Co., Leather, 62.
 Thomas, H., Architect, 95.
 Thomas, W. S., Machine, 25.
 Thomas & Iorns, Fire Escapes, 34.
 Thomine, F., Machine, 46.
 Thompson, B. T., & Co., Leather, 62.
 Thompson, T. E., Brake, 36.
 Thompson & Navell, Machine, 60.
 Thompson, W., Limestone, 95.
 Thorne, DeHaven, & Co., Machines, 20.
 Thorne, J. W., Trunks, 58.
 Thorp, Mrs. J. B., 70.
 Tidball, Mrs. F., Bedstead, 82.
 Tiffany, J. C., Generator, 18, 91.
 Tobiason & Heilbrum, 93.
 Todd, J., Wheel, 29.
 Tomlinson, Smith, & Co., Machine, 42.
 Tompkins, S. E., & Co., Hardware, 59.
 Tool & Machine Co., 43.
 Toronto Fire Extinguisher Mfg. Co., 44.
 Torrey, M. A., Indelible Ink, 83.
 Townsend, Mrs. G. L., Mach. Attachm't, 84.
 Townsend, Mrs. H. C., 79.
 Tray, E., Injector, 31.
 Traiser, C., Machine, 48.
 Trautwein, C., & Co., Leather, 60.
 Treadwell, Mrs. F. C., Dental Work.
 Tremper, Miss M., Shawl Strap, 81; Design, 83.
 Tricourt, A., Press, 47.
 Troemner, H., Mills, 38.
 Trostel & Gallum, Leather, 63.
 Trump Bros., Saws, 18.
 Tubular Barrow & Truck Mfg. Co., 20.
 Tubular Rivet Co., 60.
 Tucker, Types, 47.
 Tuerk, F. W., Wheel, 43.
 Tufts, J. W., Soda-water Apparatus, 34, 99.
 Tupper, L. B., Grate Bars, 27.
 Tupper, W. W., & Co., Grates, 27.
 Turner, B. B., & Co., Machines, 50.
 Turner, C., Couplings, 41.
 Turner, I., & Co., Machine, 24.
 Turner, Parks, & Co., Valve, 22; Separator, 37.
 Twiss, N. W., Engines, 30.
 Trygger, A., Models, 52.
 Tryon, G. K., Son, & Co., Bearings, 36.
 Tyzick, J., Motor, 44.
 Underhill & Noble, Leather, 61.
 Union Benevolent Society, Clothing, 80.
 Union Manufacturing Co., 32.
 Union Stone Co., 21.
 Union Water Meter Co., 31.
 United Power Press Co., 33.
 United States Bunting Co., 38.
 United States Corset Co., 25.
 Universal Thread Co., 25.
 Unruh, J., & Sons, Trunks, 58.
 Utica Steam Gauge Co., 31.
 Vail, S. S., Boilers, 28.
 Vail & Wallace, Water Elevator, 32.
 Valentine, W. J., Turbines, 29.
 Valin, P. V., Model, 45.
 Vallandigham, Miss N., Stand, 82.
 Valley Machine Co., Pumps, 32.
 Vandenkerckhove, P., Engines, 50.
 Van Dyke, J., 85.
 Van Flaecht, E., Models, 50.
 Vanhorn & Cranston, Cutter, 27.
 Van Hagen, C., & Co., Shapers, 20.
 Vande Mark, A. B., Engine, 33.
 Vansittart, Mrs. H., Propeller, 41.
 Vasquez, C. L., Machine, 18.
 Ventilating Waterproof Shoe Co., 58.
 Versé-Spelmans, Brichot, A., & Co., Belting, 50.
 Victor Sewing Machine Co., 25.
 Villa, C. J., Drawings, 53.
 Vital, A., Lithographic Rollers, 47.
 Vojtechovsky & Reznicek, Candy Machines, 49.
 Von Behren & Shaffer, Oar, 38.
 Von Essen, H. H., Machine, 51.
 Von Staden, W. G., Posts, 45.
 Vose, W. T., Hydropalt, 34.
 Vulcanized Fibre Co., 59.
 Waas, H. A., Trunk, 58.
 Wagener, J., Machines, 25; Sandstones, 96.
 Waldron, J. V., & Bro., Crests, 59.
 Walker, W. B., Machine, 26.
 Walker Bros., Machines, 18.
 Walker, Oakley, & Co., Leather, 63.
 Walker, Miss W., Painting, 83.
 Walker, J. H. & G. M., Boots, 57.
 Wallace & Sons, Machine, 18.
 Wallace & Tucker, Models, 41.
 Walter, J., Printing Press, 41.
 Walters, G. C., Machine, 59.
 Walton, S., Wheel, 29.
 Walton, L. W., Rowlock, 38.
 Walton Bros., Extinguishers, 34.
 Walworth Manufacturing Co., Machines, 18; Cocks, 35.
 Wannalansett Manufacturing Co., Hose, 34.
 Wanzer & Co., Machines, 43.
 Ware, Mrs. M. L., Flowers, 84.
 Wardwell, G. J., Engines, 29.
 Wardwell Manufacturing Co., 25.
 Waring Rock Drill Co., 17.
 Warth, A., Machines, 25.
 Warthorst & Co., Stone, 96.
 Warren, J., Machinery, 19.
 Warren Foundry & Machine Co., 34.
 Warwick, S. W., Soda-water Fountain, 34.
 Washburn, Mrs. J. M., 79.
 Washburn Machine Shop, 20, 24.
 Waters, C., & Co., Governors, 31.
 Waters, E., & Sons, Boats, 38.
 Waterous Eng. Works Co., 44.
 Watson, James, Lathe, 21.
 Watson, Jane, Mosses, 84.
 Watt, F. H., Trunks, 58.
 Wattis, E., jr., Flasks, 20.
 Watts, Hon. F., 65.
 Way, A. C., Painting, 83.
 Way, J. S., & Co., Leather, 63.
 Weaver, W., Drills, 17.
 Weaver & Bardall, Whips, 59.
 Webb, W. W., Models, 38.
 Webb, W. B., Leather, 61.
 Webster, S., Tank, 44.
 Weed, J. B. & F. M., Leather, 62.
 Wedekind, Hallenburg, & Bro., Leather, 60.
 Weikel & Smith Spice Co., 38.
 Weil, J., & Bros., Leather, 63.
 Weiller, J., Picture, 80.
 Weiner, P. L., Furnace, 17; Engine, 33.
 Weir, M. A., Machines, 41.
 Welby, Belting, 47.
 Welch, Alfred, Wagons, 42.
 Wells, H. F., Leather, 61.
 Wells, M. D., & Co., Boots, 56.
 Wells Balance Engine Co., 30.
 Wells & Gillespie, Heel Plates, 43.
 Wensley, J., Sewing Machines, 24; Uppers, 62.

- Wenstrom, W., Drawing, 52.
 Wentz & Clark, Leather, 63.
 Wertheim, L., Steam Packing, 49.
 West, E. J., Marking, 83.
 West, Mrs. F. R., 79.
 West Brothers, 57.
 Western File Co., 22.
 Westinghouse Air Brake Co., 36.
 Westman, W. D., Saw Machine, 43.
 Wetherill, R., & Co., Engine, 29.
 Weyhl, W., Pumps, 49.
 Wharton, Wm., jr., Machinery, 21; Turn-
 table, 37.
 Wharton Railroad Switch Co., 37.
 Wheeler & Wilson Manufacturing Co., 24.
 Wheelock & Thomas, Architects, 96.
 White, Mrs. A., Bureau, 82; Frame, 82.
 White, C. H., Switch, 37.
 White, Clark, & Co., Pump, 32.
 White, Mrs. R. P., 79.
 White, Yate, & Co., Engine, 44.
 Whitesides, Mrs. E. G., Braiding, 80.
 Whitman, Mrs. E. J., Scraper, 80; Buttons,
 81.
 Whitney, A., & Son, Wheels, 36.
 Whitney, A. H. & A. G., Decorations, 83.
 Whitney, B. D., Machinery, 19; Spinning
 Machinery, 24.
 Whitney Manufacturing Co., Machines, 25.
 Whiton, D. E., Chucks, 21.
 Whittington, F. L., Wax Work, 84.
 Wicaco Screw and Machine Works, 21.
 Wickersham & Bro., Feeder, 31.
 Wiener & Co., Hardware, 59.
 Wier, F. C., Hydrant, 35; Switch, 37.
 Wilbraham, T., & Bros., Engines, 33.
 Wilcox Tanning Co., 61.
 Wilcox & Gibbs Sewing Machine Co., 25.
 Wilder, J. L., Rosettes, 59.
 Wildgoose, F. H., Model, 45.
 Wilen, G. C., Boat, 38.
 Wilkie & Osborne, Machines, 43.
 Wilkinson, Miss G., Drawings, 83.
 Wilkinson, A. J., & Co., Lathes, 23.
 Wilkinson, J. P., & Bros., Leather, 61.
 Williams, C. B., & Sons, Sole Leather, 61.
 Williams, C. H. & G. L., Leather, 62.
 Williams, Mrs. E., Bedstead, 83.
 Williams, E. A., & Son, Metals, 31.
 Williams, Mrs. J., Basket, 84.
 Williams (C. W.) Mnfg. Co., Machines, 43.
 Williams, S., & Son, Implements, 22.
 Williams, R. P., Switches, 42.
 Williams, S. S., & Co., Elevator, 33.
 Williamson Bros., Engines, 27.
 Willimantic Linen Co., Machinery, 23.
 Willoughby, J. D., Governor, 31; Steam
 Pump, 32; Scales, 36.
 Wilson, Mrs. H. C., Bouquet, 84.
 Wilson, J. M., Architect, 87, 99.
 Wilson, R. F., Fly Nets, 59.
 Wilson Bros. & Co., Architects, 86, 89.
 Wilson, Clarke, & Co., Pump, 44.
 Wilson & Hughes Stone Co., 96.
 Wilson Sewing Machine Co., 25.
 Wilson, T., & Co., Engines, 44.
 Wimpfheimer, Mrs. C., Loom, 24.
 Windmüller & Meynen, Spools, 48.
 Windrim, J. H., Architect, 65, 89, 91.
 Winkler, G. R., Engine, 30.
 Winterros, C. E., Model, 52.
 Wireman, H., Shoes, 57.
 Wisconsin Leather Co., 60, 63.
 Wiswall, H. M., Pumps, 32.
 Woelfel, F., Leather, 62.
 Wolf, A. N., Wheel, 29.
 Woman's Art School, 81; Drawings, 83.
 Wood, H. C., M.D., 88.
 Wood, G., Leather, 63.
 Wood, G. W., Lifting Jack, 23.
 Wood, J. W., Shot Holes, 42.
 Wood, Miss M. J., Paintings, 83.
 Wood, T., Looms, 24.
 Wood, R. D., & Co., Iron Work, 35.
 Woodley, J., Boat, 45.
 Woodruff & Beaumont, Valve, 34.
 Woodruff, J., Regulator, 31.
 Woodruff, A. H., Gear, 31.
 Woods, B. O., & Co., Presses, 26.
 Woods, G., & Co., Drying Process, 25.
 Woodward, T. B., Mill Stones, 37.
 Woolley, R., & Son, Leather, 62.
 Woolredgc, A. M., Shoes, 58.
 Worcester, E. J., & Co., Drills, 20.
 Worniley, Mrs. A. E., Microscopics, 83.
 Wratislaw, Miss M., Painting, 83.
 Wright, J. W., Model, 30; Meter, 33; Model,
 35.
 Wright, Mrs. R. K., 79.
 Wright, William, Boilers, 41; Coupler, 45.
 Wright, P., & Sons, Anvils, 40.
 Wright & Rogers, Locomotive, 29.
 Wrigley, J., Loom, 23.
 Wünschmann, R., Machine, 48.
 Wyatt, J. L., Ship, 38.
 Wyman, J. D., Soldering Iron, 23.
 Wyman, L. A., Mill, 18.
 Yale Lock Manufacturing Co., Machinery, 33.
 Yeager, D. A., Harness, 59.
 Yohe, Mrs. D., Mat, 81.
 York Manufacturing Co., 26; Wheels, 29.
 Young, J. & S., Flour Bolt, 37.
 Young, Mrs. M. J., 79.
 Young, H., Machinery, 21.
 Yule, G., Machine, 25.
 Zaffarini, C. C., Nautical Machine, 53.
 Zanini, P., Steam Machine, 53.
 Zantzinger, D. W., Model, 39.
 Zaun, J., & Son, Boots, 57.
 Ziegler Bros., Shoes, 57.
 Zindgraf & Hohenadel, Mill, 17.
 Zimmermann, J., Needles, 48.
 Zipp, P. C., Leather, 63.
 Zwietsch, O., Extinguisher, 34.

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1876.

OFFICIAL CATALOGUE

Pt. II

Dept IV

DEPARTMENT OF ART.

THIRD EDITION.

PHILADELPHIA:

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1876.

4



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CONTENTS.

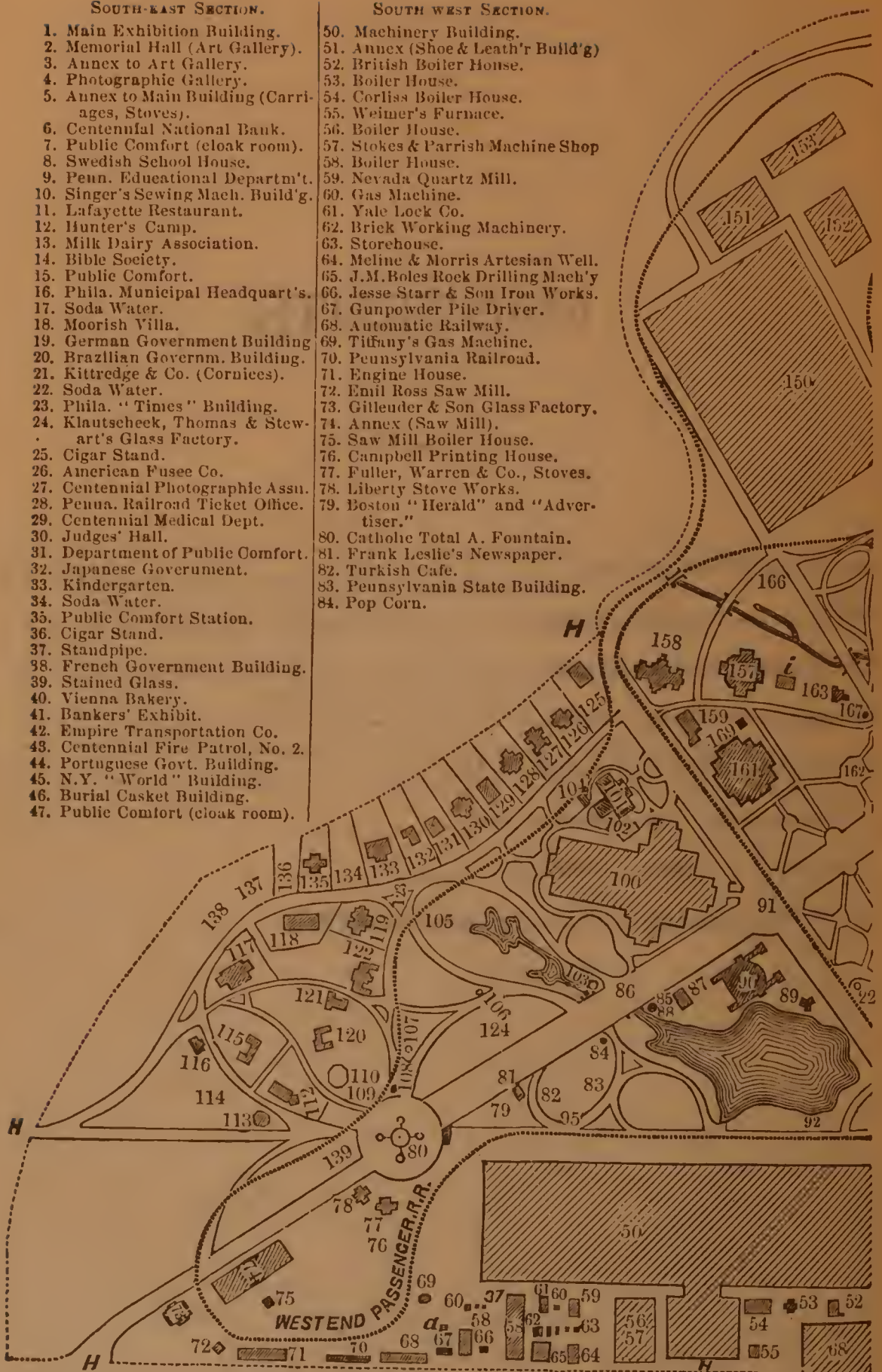
Plan of Exhibition Grounds,	6
Subject index, National exhibits,	8
The Memorial Hall and Annex,	9
Synopsis of the Classification,	12
Classification of the Department of Art,	13
Catalogue of the Department of Art,	15
Photographic Exhibition Building,	55
Alphabetical index of Exhibitors in Department IV,	59

SOUTH-EAST SECTION.

1. Main Exhibition Building.
2. Memorial Hall (Art Gallery).
3. Annex to Art Gallery.
4. Photographic Gallery.
5. Annex to Main Building (Carriages, Stoves).
6. Centennial National Bank.
7. Public Comfort (cloak room).
8. Swedish School House.
9. Penn. Educational Departm't.
10. Singer's Sewing Mach. Build'g.
11. Lafayette Restaurant.
12. Hunter's Camp.
13. Milk Dairy Association.
14. Bible Society.
15. Public Comfort.
16. Phila. Municipal Headquart's.
17. Soda Water.
18. Moorish Villa.
19. German Government Building.
20. Brazilian Governm. Building.
21. Kittredge & Co. (Cornices).
22. Soda Water.
23. Phila. "Times" Building.
24. Klautscheek, Thomas & Stewart's Glass Factory.
25. Cigar Stand.
26. American Fusee Co.
27. Centennial Photographic Assn.
28. Penna. Railroad Ticket Office.
29. Centennial Medical Dept.
30. Judges' Hall.
31. Department of Public Comfort.
32. Japanese Government.
33. Kindergarten.
34. Soda Water.
35. Public Comfort Station.
36. Cigar Stand.
37. Standpipe.
38. French Government Building.
39. Stained Glass.
40. Vienna Bakery.
41. Bankers' Exhibit.
42. Empire Transportation Co.
43. Centennial Fire Patrol, No. 2.
44. Portuguese Govt. Building.
45. N.Y. "World" Building.
46. Burial Casket Building.
47. Public Comfort (cloak room).

SOUTH WEST SECTION.

50. Machinery Building.
51. Annex (Shoe & Leath'r Build'g).
52. British Boiler House.
53. Boiler House.
54. Corliss Boiler House.
55. Weimer's Furnace.
56. Boiler House.
57. Stokes & Parrish Machine Shop.
58. Boiler House.
59. Nevada Quartz Mill.
60. Gas Machine.
61. Yale Lock Co.
62. Brick Working Machinery.
63. Storehouse.
64. Meline & Morris Artesian Well.
65. J.M. Boles Rock Drilling Mach'y.
66. Jesse Starr & Son Iron Works.
67. Gunpowder Pile Driver.
68. Automatic Railway.
69. Tiffany's Gas Machine.
70. Pennsylvania Railroad.
71. Engine House.
72. Emil Ross Saw Mill.
73. Gilleuder & Son Glass Factory.
74. Annex (Saw Mill).
75. Saw Mill Boiler House.
76. Campbell Printing House.
77. Fuller, Warren & Co., Stoves.
78. Liberty Stove Works.
79. Boston "Herald" and "Advertiser."
80. Catholic Total A. Fountain.
81. Frank Leslie's Newspaper.
82. Turkish Cafe.
83. Pennsylvania State Building.
84. Pop Corn.



GROUND PLAN OF THE

85. Rowell's Newspaper Building.
86. Leonard's Real Estate Office.
87. Public Comfort Station.
88. Soda Water.
89. New York "Tribune."
90. Froh Fries Provenance Road.
91. Sons of Temperance Fountain.
92. Colossal Arm.
93. World's Ticket Office.
94. Catering Office.
95. Loiseau's Pressed Fuel Co.
96. Office Board of Finance.
97. Office U.S. Centennial Com.
98. Bartholdi's Fountain.

NORTH-WEST SECTION.

100. U.S. Government Building.
101. U.S. Hospital.
102. U.S. Laboratory.
103. Cigar Stand.
104. Tent.
105. U.S. Signal Service.
106. Bishop Allen's Monument.
107. Soda Water.
108. Cigar Stand.
109. Canada Log House.
110. Arkansas State Building.

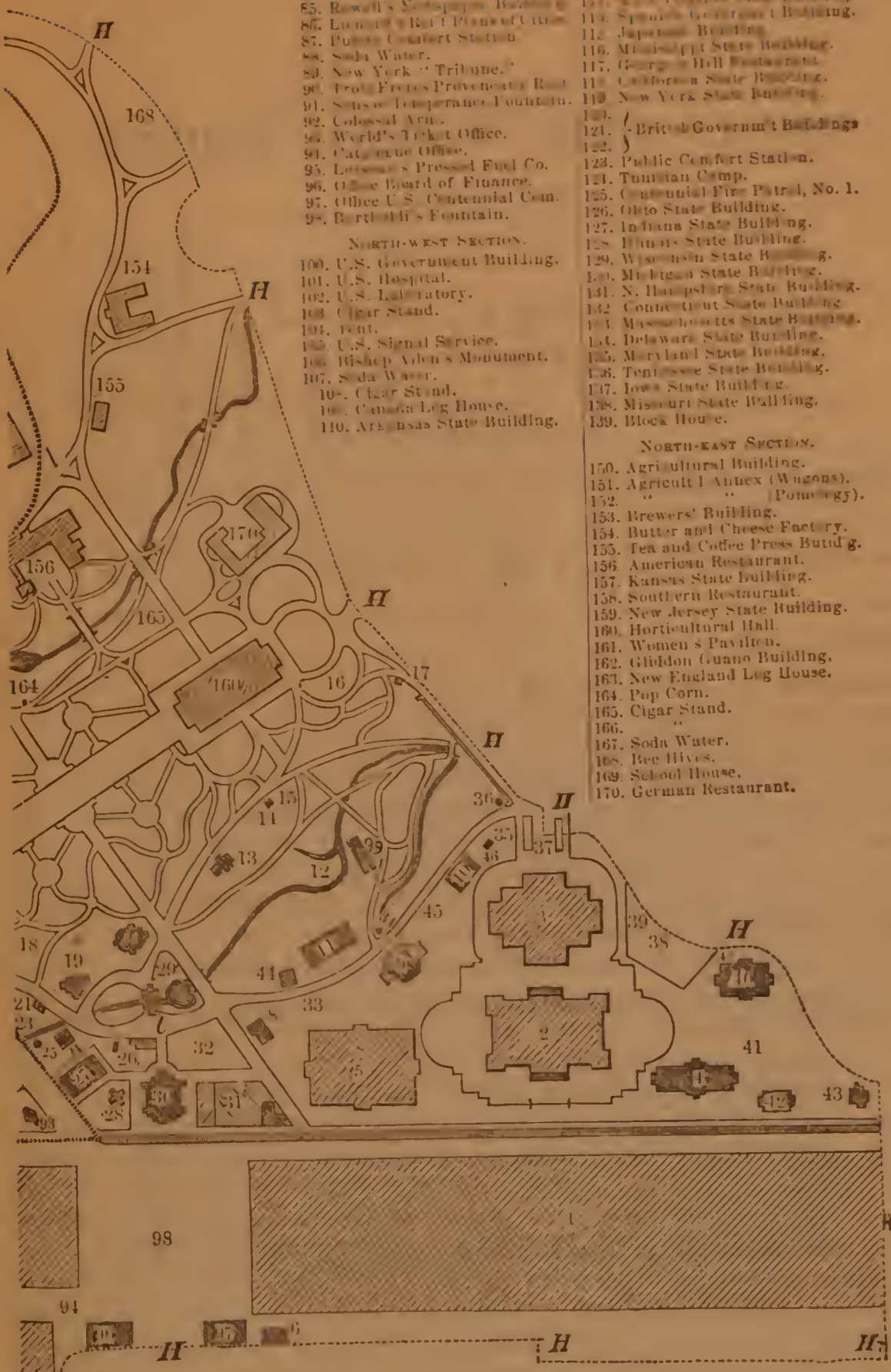
111. West Virginia State Building.
112. Spanish Government Building.
113. Japanese Building.
114. Mississippi State Building.
115. George's Hall Restaurant.
116. California State Building.
117. New York State Building.

118. } British Government Buildings
119. }

120. Public Comfort Station.
121. Tunitan Camp.
122. Centennial Fire Patrol, No. 1.
123. Ohio State Building.
124. Indiana State Building.
125. Illinois State Building.
126. Wisconsin State Building.
127. Michigan State Building.
128. N. Hampshire State Building.
129. Connecticut State Building.
130. Massachusetts State Building.
131. Delaware State Building.
132. Maryland State Building.
133. Tennessee State Building.
134. Iowa State Building.
135. Missouri State Building.
136. Block House.

NORTH-EAST SECTION.

150. Agricultural Building.
151. Agricultural Annex (Wagons).
152. " (Pomology).
153. Brewers' Building.
154. Butter and Cheese Factory.
155. Tea and Coffee Press Building.
156. American Restaurant.
157. Kansas State Building.
158. Southern Restaurant.
159. New Jersey State Building.
160. Horticultural Hall.
161. Women's Pavilion.
162. Glidden Guano Building.
163. New England Log House.
164. Pop Corn.
165. Cigar Stand.
166. " "
167. Soda Water.
168. Bee Hives.
169. School House.
170. German Restaurant.



INTERNATIONAL EXHIBITION.

SUBJECT INDEX, NATIONAL EXHIBITS.

NATIONS.	Sculpture.	Oil Paintings.	Water Colors.	Engraving and Lithography.	Art Applied.	Photography.	Industrial and Agricultural Designs, etc.	Ceramic Decorations, Mosaics, etc.	Loan Collection.
United States.....	15	15	25	29	28	55	31	28	54
Canada	33	33	33	33	33	33	34	34	..
France.....	34	35	...	40	40	41	42	42	...
Germany.....	42	...	...	42	...	43	43	...	...
Netherlands.....	43	43	...	45	...	45	45	...	...
Denmark.....	46	46	...	46	...	...	46	...	...
Sweden	46	46	47	48	...	48	48	...	...
Norway.....	49	48	48	...	49	49	...	...	...
Italy.....	50	90	...	50	...	50	50	50	...
Mexico.....	51	51	...	...	...	...	51	...	...
Brazil.....	52	...	...	52	52	52	...	...	...
Argentine Republic.....	53	53	...	53	...	53	...	53	...

N. B.—The Art exhibit of the following countries is installed in the Main Building and catalogued in that volume, viz.:

	Page
New South Wales	270
Victoria.....	154
South Australia	162
New Zealand.....	164
Cape of Good Hope.....	168
Egypt	225
China	231
Japan	238
Hawaii.....	242
Switzerland	285

ART GALLERY. No. 2.

Size 365 by 210 feet.

Architect, H. J. SCHWARZMAN.

Contractor, R. J. DOBBINS.

Iron work furnished by EDGEMOOR IRON CO., PENCOYD ROLLING MILLS.
KITTREDDGE CORNICE CO.

Stone work furnished by SARGENT & CO., WESTHAM GRANITE CO., CONSHOHOCKEN STONE CO., S. F. PRINCE & CO., EXCELSIOR BRICK CO.

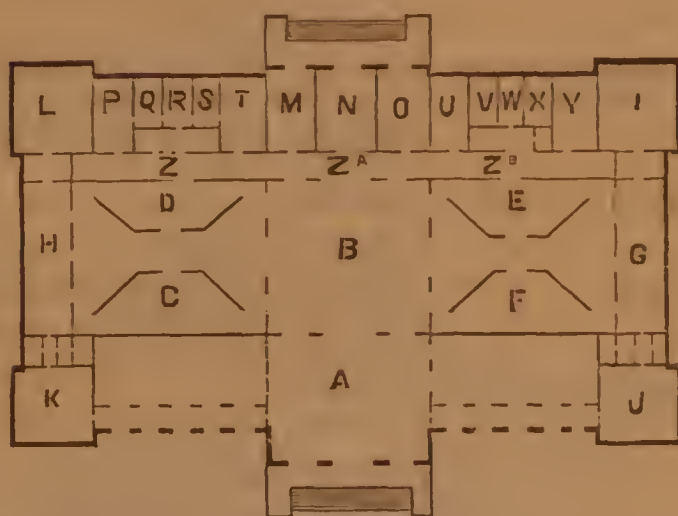
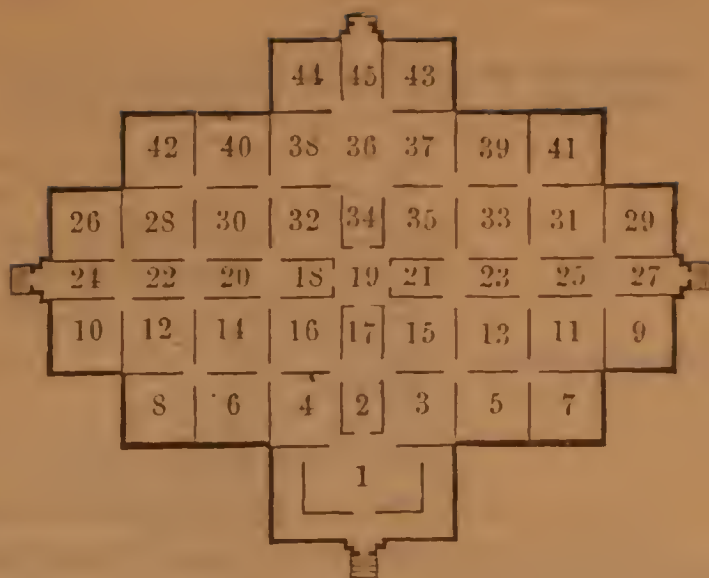
Glass furnished by SHOEMAKER & CO., WARD & CO., and J. M. ALBERTSON.

MEMORIAL HALL, built at a cost of \$1,500,000, by the State of Pennsylvania and City of Philadelphia, is placed at the disposal of the Centennial Commission, to be used during the Exhibition as an Art Gallery, after which it is designed to make it the receptacle of an Industrial Art Museum, similar to the South Kensington Museum, at London. The design is modern renaissance, and the structure is fire-proof. It covers an acre and a half, and is 365 feet long, 210 feet wide, and 59 feet high, over a basement 12 feet high. A dome, rising 150 feet above the ground, surmounts the centre, capped by a colossal ball, from which rises the figure of Columbia. The main front of this building looks southward, displaying a main entrance in the centre consisting of three arched doorways, a pavilion on each end, and two arcades connecting the pavilions with the centre. The entrance is 70 feet wide, to which there is a rise of 13 steps. Each of the doorways is 40 feet high and 15 feet wide, opening into a hall. In each pavilion there is a window 12½ feet by 34 feet, eight in all, which will be used for the display of stained glass, glass paintings, etc. The arcades designed to screen the long walls of the galleries each consist of five groined arches, and form promenades looking outward over the grounds and inward over open gardens extending back to the main wall of the building. These garden-plots are each 90 feet by 36 feet, ornamented in the centre with fountains, and intended to display statuary. The rear or north front of the building is of the same general character as the main front, but, in place of the arcade, has a series of arched windows, twelve in number, with the entrance in the centre. Between the pavilions is the grand balcony, a promenade 275 feet long and 45 feet wide, elevated 40 feet above the ground, and overlooking to the northward the grounds of the Park. On each front of the buildings the entrances open into halls, 82 feet long, 60 feet wide, and 53 feet high. These, in turn, open into the centre hall, 83 feet square, the ceiling rising over it 80 feet in height. From the east and west sides of this central hall extend the galleries, each 98 feet long, 48 feet wide, and 35 feet high. These galleries have temporary divisions for the better display of paintings, and, with the central hall, form a grand hall 287 feet long, and 83 feet wide, capable of comfortably accommodating 8000 persons. From the galleries

doorways open into two smaller galleries, 89 feet long and 28 feet wide. These open north and south into apartments connecting with the pavilion rooms, and forming two side-galleries 210 feet long. Along the whole length of the north side of the main galleries and central hall extends a corridor 14 feet wide, opening on its north line into a series of rooms, twenty-three in number, designed for studios and smaller exhibition rooms. All the galleries and the central hall are lighted from above; the pavilions and studios from the sides. The pavilions and central hall are designed especially for the exhibition of sculpture. This building gives 75,000 square feet of wall space for painting, and 20,000 square feet of floor space for statues, etc. The skylights throughout are double, the upper being of clear glass and the under of ground-glass.

The erection of the building was begun July 4th, 1874, and finished March 1st, 1876.

Great as is the space afforded in the Memorial Hall, the applications from American and foreign artists have proved so greatly in excess of its capacity as to require the erection of a much more spacious building. This, though only of brick, harmonizes architecturally with the Memorial Hall, and is to be permanent. It stands just in the rear of the original Art Gallery, and communicates with it. It affords 60,000 square feet of wall space available for paintings, and contains 30 galleries, each 40 feet square, besides 4 galleries, each 100 feet long by 54 feet wide, and two transverse central corridors, 20 feet wide.



MEMORIAL HALL.—Ground Plan.

- | | | |
|--|-------------------|--------------------------------------|
| A. Italy. | J. Germany. | T. Great Britain. |
| B. United States, Gt. Britain, Germany, France, Italy. | K. United States. | U. Italy. |
| C. United States. | L. Great Britain. | V. Italy. |
| D. Great Britain. | M. Belgium. | W. Italy. |
| E. France. | N. Italy. | X. United States. |
| F. Germany. | O. Belgium. | Y. United States. |
| G. Austria. | P. Great Britain. | Z. Great Britain. |
| H. Spain and Sweden. | Q. Great Britain. | Z ^A . United States. |
| I. France. | R. Great Britain. | Z ^B . Germany and France. |
| | S. Great Britain. | |

EXTENSION TO ART GALLERY.—Ground Plan.

- | | | |
|------------------------|--------------------------|--------------------|
| 1. Italy. | 16. United States. | 29. Portugal. |
| 2. Italy. | Superintendent's Office. | Brazil. |
| 3. Italy. | 17. Italy. | 30. United States. |
| 4. Italy. | 18. France. | 31. Spain. |
| 5. Netherlands. | 19. Italy. | 32. France. |
| 6. Germany. | 20. United States. | 33. Belgium. |
| 7. Norway. | 21. France. | 34. France. |
| Denmark. | Netherlands. | 35. France. |
| 8. United States. | 22. United States. | 36. France. |
| 9. Argentine Republic. | 23. Belgium. | 37. France. |
| Chili. | Netherlands. | 38. France. |
| Mexico. | 24. United States. | 39. Belgium. |
| 10. United States. | 25. Spain. | 40. United States. |
| 11. Sweden. | Sweden. | 41. Belgium. |
| 12. United States. | 26. Canada. | 42. United States. |
| 13. Netherlands. | 27. Portugal. | 43. France. |
| 14. United States. | Argentine Republic. | 44. France. |
| 15. Netherlands. | Brazil. | 45. France. |
| | 28. United States. | |

SYNOPSIS OF THE CLASSIFICATION.

LOCATION.	DEPARTMENTS.	CLASSES.	GROUPS.
MAIN BUILDING.	I. MINING AND METALLURGY.	100—109	Minerals, Ores, Stone, Mining Products.
		110—119	Metallurgical Products.
		120—129	Mining Engineering.
	II. MANUFACTURES.	200—205	Chemical Manufactures.
		206—216	Ceramics, Pottery, Porcelain, Glass, etc.
		217—227	Furniture, etc.
		228—234	Yarns and Woven Goods of Vegetable or Mineral Materials.
		235—241	Woven and Felted Goods of Wool, etc.
		242—249	Silk and Silk Fabrics.
		250—257	Clothing, Jewelry, etc.
		258—264	Paper, Blank Books, Stationery.
		265—271	Weapons, etc.
		272—279	Medicine, Surgery, Prothesis.
		280—284	Hardware, Edge Tools, Cutlery, and Metallic Products.
		285—291	Fabrics of Vegetable, Animal, or Mineral Materials.
		292—296	Carriages, Vehicles, and Accessories.
	III. EDUCATION AND SCIENCE	300—309	Educational Systems, Methods, and Libraries.
		310—319	Institutions and Organizations.
		320—329	Scientific and Philosophical Instruments and Methods.
		330—339	Engineering, Architecture, Maps, etc.
		340—349	Physical, Social, and Moral Condition of Man.
ART GALLERY.	IV. ART.	400—409	Sculpture.
		410—419	Painting.
		420—429	Engraving and Lithography.
		430—439	Photography.
		440—449	Industrial and Architectural Designs, etc.
		450—459	Ceramic Decorations, Mosaics, etc.
MACHINERY BUILDING.	V. MACHINERY.	500—509	Machines, Tools, etc., of Mining, Chemistry, etc.
		510—519	Machines and Tools for working Metal, Wood, and Stone.
		520—529	Machines and Implements of Spinning, Weaving, etc.
		530—539	Machines, etc., used in Sewing, Making Clothing, etc.
		540—549	Machines for Printing, Making Books, Paper Working, etc.
		550—559	Motors, Power Generators, etc.
		560—569	Hydraulic and Pneumatic Apparatus.
		570—579	Railway Plant, Rolling Stock, etc.
		580—589	Machinery used in Preparing Agricultural Products.
		590—599	Aerial, Pneumatic, and Water Transportation.
			Machinery, and Apparatus, especially adapted to the requirements of the Exhibition.
AGRICULTURAL BUILDING.	VI. AGRICULTURE.	600—609	Arboriculture and Forest Products.
		610—619	Pomology.
		620—629	Agricultural Products.
		630—639	Land Animals.
		640—649	Marine Animals, Fish Culture, and Apparatus.
		650—662	Animal and Vegetable Products.
		665—669	Textile Substances of Vegetable or Animal origin.
		670—679	Machines, Implements, and Processes of Manufacture.
		680—689	Agricultural Engineering and Administration.
		690—699	Tillage and General Management.
HORTICULTURAL BUILDING.	VII. HORTICULTURE.	700—709	Ornamental Trees, Shrubs, and Flowers.
		710—719	Hot Houses, Conservatories, Graperies.
		720—729	Garden Tools, Accessories of Gardening.
		730—739	Garden Designing, Construction, and Management.

CLASSIFICATION.

DEPARTMENT IV.—ART.

SCULPTURE.

- CLASS 400.—Figures and groups in stone, metal, clay, or plaster.
CLASS 401.—Bas-reliefs, in stone or metal; electrotypes copies.
CLASS 402.—Medals, pressed and engraved; electrotypes of medals.
CLASS 403.—Hammered and wrought work—*repoussé* and *rehaussé* work, embossed and engraved relief work.
CLASS 404.—Cameos, intaglios, engraved stones, dies, seals, etc.
CLASS 405.—Carvings in wood, ivory, and metal.

PAINTING.

- CLASS 410.—Paintings in oil on canvas, panels, etc.
CLASS 411.—Water color pictures; aquarelles, miniatures, etc.
CLASS 412.—Frescoes, cartoons for frescoes, etc.
CLASS 413.—Painting with vitrifiable colors. Pictures on porcelain, enamel, and metal.

ENGRAVING AND LITHOGRAPHY.

- CLASS 420.—Drawings with pen, pencil, or crayons.
CLASS 421.—Line engravings from steel, copper, or stone.
CLASS 422.—Wood engravings.
CLASS 423.—Lithographs, zincographs, etc.
CLASS 424.—Chromo-lithographs.


PHOTOGRAPHY.

- CLASS 430.—Photographs on paper, metal, glass, wood, fabrics, or enamel surfaces.
CLASS 431.—Prints from photo-relief plates, carbon prints, etc.
CLASS 432.—Photo-lithographs, etc.
CLASS 433.—Photographic apparatus and supplies.

INDUSTRIAL AND ARCHITECTURAL DESIGNS, MODELS, AND DECORATIONS.

- CLASS 440.—Industrial designs.
CLASS 441.—Architectural designs; studies and fragments, representations and projects of edifices; restorations from ruins and from documents.
CLASS 442.—Decoration of interiors of buildings.
CLASS 443.—Artistic hardware and trimmings, artistic castings, forged metal work for decoration, etc.

DECORATION WITH CERAMIC AND VITREOUS MATERIALS, MOSAIC AND INLAID WORK.

- CLASS 450.—Mosaic and inlaid work in stone.
CLASS 451.—Mosaic and inlaid work in tiles, tessaræ, glass, etc.
CLASS 452.—Inlaid work in wood and metal, parquetry, tables, etc.
CLASS 453.—Stained glass.
CLASS 454.—Miscellaneous objects of art.
- 

UNITED STATES.

Sculpture, Oil Paintings.

Sculpture.

- 1 Bavier, F.—Pope Pius IX (Bronze bust). 400
- 2 Bretchman, Ed., Philadelphia, Pa.—Jas. L. Claghorn (bronze medallion). 401
- 3 Caverly, C.—John Brown (Bronze bust). 400
- 4 Cooper, Edw.—Peter Cooper (Marble medallion). 401
- 5 Cassett, Waugh, Miss Ida, Philadelphia, Pa.—Medallion. 401
- 6 Ellis, S., Bridgeport, Conn.—Elias Howe (bronze statue). 400
- 7 Freeborne, S. M., New York, N. Y.—The Vision of St. Christopher (marble). 400
- 8 French, Daniel Chester, Concord, Mass.—The Minute Man (plaster cast). 400
- 9 Freeman, J. E., Boston, Mass.—A Study of an Angel. 400
- 10 Griffin, Julia.—Dr. Chapin (Bust). 400
- 11 Gerardin, G., Philadelphia, Pa.
a Bouquet of flowers (marble). 400
b Basket of flowers (marble). 400
- 12 Granger, Pearson E., Lancaster, Pa.—Specimens of monumental lettering. 400
- 13 Grace, Joseph, New York, N. Y.
a First Step (marble statue). 400
b Infant Bacchus (marble statue). 400
c St. Mary (marble medallion). 401
d Model of a monument to Dr. Wales. 400
- 14 Garrdent, A.—Wm. M. Evarts (bust). 400
- 15 Hartley, I. S., New York, N. Y.—The Young Samaritan (marble statue). 400
- 16 Jacquier, Eli, Cincinnati.—New bust of Shakespeare (marble). 400
- 17 Kretschman, E. A., Philadelphia, Pa.—Portraits in relief (bronze). 401
- 18 Kemeys, Edward, New York, N. Y.
a Coyote and Raven (plaster). 400
b Wild Cat and Possum (plaster). 400
c Under the Wolf Skin (plaster). 400
- 19 Miller, W., Philadelphia, Pa.—Portraits of the Signers of the Declaration of Independence (50 bronze medallions). 401
- 20 Meynen, F., Philadelphia, Pa.—Virgin and Child (marble statue). 400
- 21 ———, New York, N. Y.—Gottschalk, the American Pianist (bust in marble). 400
- 22 Mundhenk, A., Cincinnati, Ohio.—Group, life size, representing Auld Lang Syne (marble). 400
- 23 Page, Wm., New York, N. Y.—Bust of Shakespeare (bronze). 400

- 24 Perkins, G. F. T., New York, N. Y.—Sir Walter Scott (medallion portrait). 401
- 25 Reniers, P. C., Pittsburg, Pa.—Col. Thos. A. Scott (bust in marble). 400
- 26 Rogers, J., New York, N. Y.—Statuettes, groups in stone, designs for the lawn. 400
- 27 Rogers, R., Rome, Italy.
a Ruth (marble statue). 400
b Nydia (marble statue). 400
- 28 Richards, D., Chicago, Ill.
a Il Penseroso (marble bust). 400
b The Barber Dentist (plaster group). 400
c Mrs. Laird Colyer (plaster bust). 400
d Disgusted (plaster group). 400
e Satisfaction (plaster group). 400
- 29 Reinhart, B. F.
a Latona and Children (heroic size). 400
b General Lee (medallion). 401
- 30 St. Gaudens, Aug., New York, N. Y.
a Admiral Farragut (bronze bust) 400
b Hiawatha (marble statue). 400
c Hon. Wm. M. Evarts (marble bust). 400
- 31 Seelig & Co., Williamsburg, N. Y.—Statuary (in spelter). 400
- 32 Turini, G., New York, N. Y.
a Iris (marble). 400
b Angelica and Medora (marble). 400
c The Boy Shakespeare (marble). 400
d Model Emblematic of the Emancipation of Slavery. 400
- 33 Volk, L. W., Chicago, Ill.
a Abraham Lincoln (marble bust). 400
b Stephen A. Douglas (marble bust). 400
- 34 Whitney, Anne, Boston, Mass.
a Roma. 400
b Charles Sumner. 400
- 35 Warner, Olin L., New York, N. Y.—Edwin Forrest (plaster medallion). 401
- 36 Pickes, D. M.—Bronze medallion. 401
- 37 Rowe, Geo. A., Philadelphia, Pa.—Impressions of seals, gems, and medals. 404

Oil Paintings.

- 38 Armstrong, D. W., New York, N. Y.
a Twilight on the Tiber. 410
b Column of St. Mark. 410
- 39 Alexander, Francis, Boston, Mass.—F. Alexander (portrait). 410
- 40 Arnold, Miss Catharine H., New York, N. Y.—The late Dr. Comstock (portrait). 410

Oil Paintings.

- 41 Anderson, A. A.
a Cairo. 410
b Roumanian Peasant Girl. 410
- 42 Audubon, J. J., Philadelphia, Pa.
a Animal painting. 410
b Animal painting. 410
- 43 Andrews, E. F., Paris, France.
a Child's Portrait. 410
b Portrait of Gentleman. 410
c Portrait of Gentleman. 410
d Portrait of Gentleman. 410
e Portrait of Gentleman. 410
f La petite Leonie. 410
g Portrait of Lady. 410
- 44 Arnold, Mrs. Esther P., Springport, Mich.—Vicar of Wakefield addressing his Family. 410
- 45 Alexander, Fanny, Boston, Mass.
a Nella Feeding her Doves. 410
b Settembre. 410
c Una Preghiera. 410
d Madonna. 410
- 46 Adams, Miss, Boston, Mass.—Head of an Old Man. 410
- 47 Brown, Chas. V., Philadelphia, Pa.—Wm. J. Clark, Jr. (portrait). 410
- 48 Brown, Harry B., Portland, Me.—On the Coast of Maine. 410
- 49 Brainerd, Mrs. M. N., Lansing, Mich.—“Indian Telegraph” Sunset in the Gila Country. 410
- 50 Briscoe, F. D., Philadelphia, Pa.—Breezy Day off Dieppe. 410
- 51 Bridgman, C. J., Brooklyn, N. Y.—Lady (portrait). 410
- 52 Brenner, Carl C., Louisville, Ky.—Landscape. 410
- 53 Bell, John W., New York, N. Y.—View on Lake Champlain (landscape). 410
- 54 Benton, Dwight, Cincinnati, O.—Evening on the Ohio. 410
- 55 Beeson, Ella L., Pittsburg, Pa.
a Ophelia. 410
b The Last Toilet of Cleopatra. 410
- 56 Bonfield, V. de V., Philadelphia, Pa.—Drifting Snow. 410
- 57 Bristol, J. B., New York, N. Y.—Mount Oxford from Lake Memphramagog, Canada. 410
- 58 Bannister, E. M., Providence, R. I.—Under the Oaks (landscape). 410
- 59 Brooks, A. F., Chicago, Ill.—23d Psalm. 410
- 60 Bruecke, George, New York, N. Y.—The Discovery of America by Columbus. 410
- 61 Bispham, Henry C., New York, N. Y.
a The Stampede. 410
b American Deer. 410
- 62 Bruss, Geo. De F., New York, N. Y.—Ideal portrait. 410
- 63 Blashfield, E. H., Brooklyn, N. Y.—“Treasure Trove.” 410
- 64 Blackwell, Miss S. E., New York, N. Y.—The Flower's Name. 410
- 65 Brüll, David, New York, N. Y.—Walther von der Vogelweide. 410
- 66 Bunner, Andrew I., Munich, Bavaria.—Landscape. 410
- 67 Bigelow, D. F., Chicago, Ill.
a American Scenery. 410
b Landscape. 410
- 68 Burton, William John, Chicago, Ill.
a The Irish Rocky Glen. 410
b Rafting on the Lower Rhine. 410
c View on the Hudson. 410
- 69 Brooks, Samuel, San Francisco, Cal.—California Salmon. 410
- 70 Bierstadt, Albert, New York, N. Y.
a The Great Trees, Mariposa Grove, Cal. 410
b Mt. Hood, Oregon. 410
c The Settlement of California, Bay of Monterey, June 3d, 1770. 410
d Spring in California. 410
e Yosemite Valley from Glacier Point Trail. 410
f Western Kansas. 410
- 71 Baldwin, Albert A., New York, N. Y.—Owl and Ducks. 410
- 72 Benson, Eugene, Rome, Italy.
a Interior of St. Mark's. 410
b The Strayed Maskers. 410
- 73 Beard, W. H.
a Lo, the Poor Indian. 410
b March of Silenus. 410
- 74 Brucken.—Summer Morning. 410
- 75 Bridgeman, F. A.
a Bringing in the Corn. 410
b Kybelien Women. 410
c Flower of the Amen. 410
d Story-Teller. 410
e Women on the Nile. 410
- 76 Burt, Martha.—Homely Flowers. 410
- 77 Baker.
a Portrait of Elliott. 410
b Portrait of Mrs. Andrew Stuart. 410
- 78 Bacon, Henry, Boston, Mass.—The Boston Boys and General Gage, 1775. 410
- 79 Brown, W. Warren, Boston, Mass.—Spurwink River. 410
- 80 Brackett, W. M., Boston, Mass.
a The Rise. 410
b The Leap. 410
c Last Struggle. 410
d Landed. 410
- 81 Baker, Miss M. K., Boston, Mass.—Azaleas. 410
- 82 Boot, Elizabeth, Boston, Mass.—Head. 410
- 83 Brown, G. L., Boston, Mass.—Sunset, Genoa. 410
- 84 Boughton, Geo. H., Philadelphia, Pa.—Going to Seek his Fortune. 410
- 85 Birch, Thomas, Philadelphia, Pa.
a North-easter in Mid-ocean. 410
b Coast Scene. 410
c Perry's Victory. 410
- 86 Burnes, C. M., Philadelphia, Pa.—The Power Behind the Throne. 410
- 87 Blois, F. B. de, Boston, Mass.
a Winter Morning, Lincola, Italy. 410
b October Day. 410
- 88 Bartlett, G. H., Boston, Mass.
a Church Door. 410
b Leaf. 410
- 89 Beard, J. H.
a “Many a slip,” etc. 410
b Attorney and his Client. 410
c Out all Night. 410
- 90 Billings, E. T., Boston, Mass.
a Wendell Phillips. 410
b Wheelwright Shop. 410
- 91 Christensen, C. C. A., Ephraim, Utah.—Mormon Emigrants crossing the Plains with Handcarts. 410

Oil Paintings.

- 92 Cardozo, Thomas de, New York, N. Y.
a Portrait. 410
b Portrait. 410
- 93 Cole, J. Foxcroft, Boston, Mass.
a Pastoral Scene in Normandy. 410
b Landscape and Cattle. 410
c Coast of Normandy. 410
d Midnight in Melrose. 410
- 94 Craig, Thos. B., Philadelphia, Pa.—
 Indian Summer. 410
- 95 Culverhouse, J. M., Philadelphia, Pa.
a Excursion by Torch and Moonlight. 410
b Market Scene by Candle and Moonlight. 410
- 96 Carlin, John, New York, N. Y.—Ig-
 nis Fatuus, the Symbol of Pleasure. 410
- 97 Cole, Thomas.
a The Cross and the World. 410
 1. The Start in Life. 410
b The Cross and the World. 410
 2. Adversity. 410
c The Cross and the World. 410
 3. Triumph of the Cross. 410
- 98 Cameron, Miss Kate, Paris, France.
 —Italian Girl. 410
- 99 Currier, I. F., Munich, Bavaria.—
 Study of a Head. 410
- 100 Catlin, George.—Indian Pictures
 (a collection). 410
- 101 Casilear, J. W., New York, N. Y.
a Twilight, Catskill Mountains. 410
b Lake George, from Sabbath Day Point. 410
c Wooded Stream. 410
- 102 Colman, Saml., New York, N. Y.
a The Merchant of Laghouat. 410
b Twilight on the Western Plains. 410
- 103 Crano, F. F. de, Philadelphia, Pa.
 —The Celestial Model. 410
- 104 Creifelds, Richard, Munich, Bava-
 ria.—Study. 410
- 105 Chase, Frank R., Smyrna, Mich.—
 Gen. U. S. Grant (portrait). 410
- 106 Cropsey, J. F.
a Old Mill. 410
b Church, Isle of Wight. 410
c Italy. 410
- 107 Collyer, Vincent.—Columbia River,
 Cascade Mountains. 410
- 108 Clowes, C. M., New York, N. Y.—
 Cattle. 410
- 109 Champney, Benj., Boston, Mass.
a Artists' Brook, North Conway, Mass. 410
b Old Willows at Manchester, Mass. 410
c At Glenora, New York. 410
- 110 Cabot, Ed. C., Boston, Mass.
a Pudding-Stone Boulder. 410
b Baker's Road. 410
c Woods at Beverly Farm. 410
- 111 Champney, J. W., Boston, Mass.
a Your Good Health. 410
b Grandma's Pet. 410
c "Speak, Sir." 410
d "Don't Touch." 410
- 112 Cobb, Darius, Boston, Mass.—
 Cyrus Cobb (portrait). 410
- 113 Chan, Will M., Munich, Bavaria.
a Portrait. 410
b Study of a Head. 410
- 114 Couran, Mrs.—French Village. 410
- 115 Dart, M.—Portrait. 410
- 116 Dahlgreen, Carl, Salt Lake City,
 Utah.—Early Morning View of Ophir
 Mining Camp, East Canyon, Utah. 410
- 117 De Voe, W. M., Urbana, O.—
 Hon. Rufus P. Spalding (portrait). 410
- 118 Durand, A. B., New York, N. Y.
a Gouverneur Kemble (portrait). 410
b Il Pappagallo, ideal head. 410
c Declaration of Independence. 410
d Ariadne. 410
e Muidra. 410
f Three portraits. 410
g Studies from nature. 410
h Katerskill Clove. 410
- 119 Deming, Miss Charlotte, New
 York, N. Y.—Salutation of 1876. 410
- 120 Dougherty, Edw. D., Philadelphia,
 Pa.—Tennessee. 410
- 121 Dielman, Frederick, Munich, Ba-
 varia.—Study. 410
- 122 Dolph, I. H., New York, N. Y.
a The Antiquarian. 410
b Returning from Pasture. 410
- 123 Drexler, A., New York, N. Y.—
 Scene from "King Lear." 410
- 124 Doolittle, Edwin S., New York,
 N. Y.
a Prayer to the Virgin. 410
b Soliloquy. 410
- 125 DeGolier, Miss K. E., New York,
 N. Y.
a Glimpse of the Meadow. 410
b Fleur-de-lis. 410
- 126 DeHaas, William F., New York,
 N. Y.
a On Conception Bay, Newfoundland. 410
b Off Guidi-Vidi near St. Johns, New-
 foundland. 410
c St. Mathew. 410
- 127 DeHaas, M. F. H., New York,
 N. Y.
a Brig Hove-to for a Pilot. 410
b Drifted Ashore in a Fog. 410
c Moonrise at Sunset. 410
- 128 Du Bois, Charles E., New York,
 N. Y.—Willows at East Hampton. 410
- 129 Dirksen, Frank, Peoria, Ills.
a City of Peoria, Ills. 410
b City of Galesburg, Ills. 410
c City of Burlington, Iowa. 410
- 130 De Luce.—A Dish for my Lord's
 Supper. 410
- 131 Darrah, S. T., Boston, Mass.
a Sundown. 410
b Lake Champlain. 410
- 132 Daniels, G. F., Boston, Mass.—
 Crown Point and the Narrows, Lake
 Champlain. 410
- 133 Earle, John, Pittsburg, Pa.—Mag-
 dalene. 410
- 134 Elliott, Charles L.—Edwin Forrest
 (portrait). 410
- 135 Eakins, Thomas, Philadelphia,
 Pa.
a Lady's Portrait. 410
b Dr. Rand. 410
c Chess Players. 410
- 136 Evans, De Scott, Cleveland, Ohio.
 —Miss Effie E. Ellsler (portrait). 410
- 137 Elkins, Henry A., Chicago, Ill.—
 Shasta, an extinct Volcano in Cali-
 fornia. 410
- 138 Evans, B. R., Philadelphia, Pa.—
 Temple of Horror. 410

Oil Paintings.

- 139 Ewell, D. Jerome, Boston, Mass.
a Port of Antwerp. 410
b Downs near Ostend. 410
- 140 Enneking, Jno. E., Boston, Mass.
 —Moonlight on the Canal della Guidecca, Venice. 410
- 141 Fitch, John L., New York, N. Y.—
 In the Woods. 410
- 142 Fisher, F. J., Washington, D. C.—
 Christ Lamenting over Jerusalem. 410
- 143 Feldman, Chas., Philadelphia, Pa.
 —Natural Birds. 410
- 144 Fassitt, Mrs. C. A., Washington,
 D. C.—Chief-Justice Waite (portrait). 410
- 145 Furness, Horace Howard, Philadel-
 phia, Pa.
a Rev. Dr. Furness (portrait) 410
b Portrait. 410
c Portrait. 410
d Portrait. 410
e Portrait. 410
f El Majo. 410
- 146 Frenchard, Edw., New York, N. Y.
 —"The stormy waves dashed high on a
 rock-bound coast." 410
- 147 Fletcher, Vincent.—Washington's
 Triumphant Entry into New York. 410
- 148 Farris, W. A., Oil City, Pa.—Even-
 ing (landscape). 410
- 149 Ford, Henry C., Chicago, Ill.—
 Forest Interior. 410
- 150 Flagg, Jared B., New York.
a Commodore Vanderbilt (portrait). 410
b Ideal Figure Picture. 410
c Picture of a Lady. 410
- 151 Flug, Anton, Chicago, Ill.—Flight
 of Aurora. 410
- 152 Flagg, Henry C., Millburn, N. J.
 —Evening before the Deluge. 410
- 153 Farrer, Henry, New York, N. Y.
a The Old House on the Hill at Twilight. 410
b The Highlands of the Hudson. 410
c A Windy Day, L. I. 410
d Sunrise on the East River. 410
e White Head Cliff, Coast of Maine. 410
f Afternoon on the Staten Island Shore 410
- 154 Fowler, Trevor T., Philadelphia,
 Pa.—A Young Friend. 410
- 155 ———, New York, N. Y.—Evan-
 geline. 410
- 156 Fenn, S. H.
a Old Convent Gate. 410
b Old Fireplace. 410
c Study of Boats. 410
- 157 Fisher, Ellen.—Am. Velvet Leaf. 410
- 158 Fabronius, D. C., Boston, Mass.
a Artist (portrait). 410
b Duchess of Edinburgh (portrait). 410
c Baby (portrait). 410
- 159 Guthers, Carl, St. Louis, Mo.
a Awakening Spring. 410
b Ecce Homo. 410
- 160 Guy, S. J., New York, N. Y.—Sup-
 plication. 410
- 161 Gay, W. Allen, Boston, Mass.—
 Wind Mills of Deft Haven, Holland. 410
- 162 Gay, Walter, Boston, Mass.—Fall
 Flowers. 410
- 163 Gunnison, Miss Maria D., New
 York, N. Y.—Waiting for her Play-
 mates. 410
- 164 Gignoux, R.—Landscape. 410
- 165 Galvan, I. Ernest, Philadelphia, Pa.
a Red Riding Hood. 410
b Portrait. 410
- 166 Galvan, Mrs. S. M., Philadelphia,
 Pa.
a Study of Flowers. 410
b Study of Flowers. 410
- 167 Granbey, Miss Henrietta A., New
 York, N. Y.—Autumn Flowers. 410
- 168 Granbey, Miss Virginia, New
 York, N. Y.—Spring Flowers. 410
- 169 Gookins, J. F., Chicago, Ills.
a Seeing the Bogies. 410
b Fete Day in Fairyland. 410
c A New Dynasty. 410
d Nemesis—An Episode of the Desert. 410
- 170 Gregori, Luigi, Chicago, Ill.—Mon-
 tezuma, a Young Apache. 410
- 171 Greene, E. D. E., New York, N. Y.
 —Repose. 410
- 172 Guerber, S. L., New York, N. Y.—
 Pilgrims on their Way to Rome. 410
- 173 Galland, A. Hawley, New York,
 N. Y.—The Trio in Mischief. 410
- 174 Greatorrex, Mrs. Eliza, New York,
 N. Y.—Five Studies of the Old Churches
 and Houses of Old New York. 410
- 175 Gogler, Louis, New York, N. Y.
a Peacock from Life. 410
b Fruits and Flowers. 410
- 176 Granger, Florence, New York,
 N. Y.—Oil Painting. 410
- 177 Grayon, C. P., Philadelphia, Pa.—
 Sunset, Block Island, Hauling the Seine. 410
- 178 Gifford, R. S., New York, N. Y.
a A Twilight in the Adirondacks. 410
b Sunrise on the Seashore. 410
c Shrewsbury River, Sandy Hook. 410
d Brown River. 410
e San Giorgio, Venice. 410
f Pallanza, Lago Maggiore. 410
g Fishing-boats of the Adriatic. 410
h Sta Maria delle Salute. 410
i Monte Ferro, Lago Maggiore. 410
k On the Nile. 410
l Lake Geneva. 410
m The Golden Hour. 410
- 179 Graham, Wm., Rome, Italy.
a Column of St. Mark's, Venice, Morning
 effect. 410
b View of Lone Mountain, near San Fran-
 cisco, Cal. 410
c Campo S. Giovanni, Venice. 410
- 180 Graves, Miss L. P., New Haven,
 Conn.—Flowers. 410
- 181 Gray, Henry Peters, New York,
 N. Y.
a Evening. 410
b Solitaire. 410
c The Wages of War. 410
d The Apple of Discord. 410
e Models from Cadore. 410
- 182 Gunnington, Miss, Philadelphia,
 Pa.—Captain Gunnington (portrait). 410
- 183 Gardener, E. J., Philadelphia, Pa.—
 Mignon. 410
- 184 Gay, Edw.—Late afternoon near
 Albany. 410
- 185 Green, F. W., Cleveland, Ohio.—
 The Poor Relations. 410
- 186 Galinde, R. E., Philadelphia, Pa.—
 Arabesque Design. 410

Oil Paintings.

- 187 Goodes, Edward A., Philadelphia, Pa.
a Loch Katrine. 410
b "It still waves," One Country and One Flag. 410
c "Sons of Freedom." Rising of the Colonies. 410
- 188 Gerry, Samuel L., Boston, Mass.—American Tourists. 410
- 189 Gudin, T.—Marine view. 410
- 190 Horn, Harriet E. Van V., Jersey City, N. J.—On the Boquet River, Essex Co., N. Y. 410
- 191 Harrison, Miss Harriet N., Sage College, N. Y.
a Water Lilies. 410
b Drake on a Log. 410
c Pride. 410
d "'Twas ever thus from childhood's hour." —Moore. 410
e We're all Free. 410
- 192 Homer, Winslow, New York, N. Y.
a Snap the Whip. 410
b The American Type. 410
- 193 Hoesslin, George, Munich, Bavaria.
a Portrait head. 410
b Portrait head. 410
- 194 Haight, Henry J., New York, N. Y.
a Tekaharawa Glen, Cherry Valley, N. Y. 410
b Assassination of Lieut. Wormwood by Brandt. 410
- 195 Harnett, Wm., New York, N. Y.—Fruit. 410
- 196 Harrison, Henry, Jersey City, N. J.
a Governor Bedle (portrait). 410
b Miss Belle Dodd (portrait). 410
- 197 Henning, H. D. A., Baltimore, Md.—Happy Days in the Valley of Nysa. 410
- 198 Hope, James, Watkins, N. Y.—Rainbow Falls, Watkins' Glen. 410
- 199 Herzog, H., Philadelphia, Pa.
a Norwegian Waterfall. 410
b Sentinel Rock and Union Point, Yosemite, California. 410
- 200 Hall, Cyrenius, Chicago, Ill.—Beggar Children. 410
- 201 Holmer, Phil. H., Gardiner, Maine.—Early Summer in New England. 410
- 202 Hepburn, William, Brooklyn, N. Y.
a Peace and Felicity. 410
b Reposing. 410
- 203 Hayward, H. D., Waukegan, Ill.—Portrait. 410
- 204 Heade, M. I., New York, N. Y.
a Off the California Coast. 410
b Flowers. 410
- 205 Hirst, Miss Claude R., Cincinnati, Ohio.—The Rival Lovers. 410
- 206 Howell, Mrs. J. R., Buffalo, N. Y.
a Portrait. 410
b Flower Piece. 410
- 207 Hamilton, H., Buffalo, N. Y.—The Valley of Fountains. 410
- 208 Hopkins, Robert, Detroit, Mich.—Loch Katrine. 410
- 209 Hetzel, Geo., Pittsburg, Pa.—Forest Scene in Pennsylvania. 410
- 210 Hynemann, Herman N., Philadelphia, Pa.—In the Lauterbrunnen Valley. 410
- 211 Hackett, Clara C., Jamaica, N. Y.—Hackett in the Character of Rip Van Winkle (portrait). 410
- 212 Haseltine, Wm. S., Rome, Italy.
a Natural Arch at Capri. 410
b Monuments, Ruins of a Roman Theatre at Taormina, in Sicily. 410
- 213 Hill, Thomas, San Francisco, Cal.
a Donner Lake, from Western Summit of Sierras. 410
b Yosemite Valley. 410
c Home of the Eagle. 410
- 214 Hillyer, H. L., Washington, D. C.—Clearing up the Homestead. 410
- 215 Heaton, A. G., New York, N. Y.—Washington as Ambassador. 410
- 216 Harris, Philip S., Brooklyn, N. Y.
a Wm. M. Evarts (portrait). 410
b Miss Ada F. Harris (portrait). 410
- 217 Healy, George P. A., Paris, France.
a Portrait. 410
b Portrait. 410
c Portrait. 410
d Portrait. 410
- 218 Haskell, Sarah E., Syracuse N. Y.
a Rufus Choate (portrait). 410
b Horace Greeley (portrait). 410
c Charles Sumner (portrait). 410
- 219 Hopps, H. H. H., Sedalia, Mo.—St. Orgueil Castle, Old Jersey, France. 410
- 220 Holbrook.—Portrait. 410
- 221 Hunt.—Portrait. 410
- 222 Hart, Jas. M.—Cattle and Landscape. 410
- 223 Huntington, Danl., New York, N. Y.
a Portrait. 410
b Philosophy and Art. 410
c Sowing the Word. 410
d Lake George. 410
e Lady (portrait). 410
f Titian and Charles V. 410
g Geo. F. Trimble (portrait). 410
- 224 Hubbard.
a Coming Storm. 410
b Adirondacks. 410
c Early afternoon. 410
- 225 Harterick, H.—American Cedar Forest. 410
- 226 Henshelwood, C. B. & R.—Pet Lamb. 410
- 227 Henry, E. L.
a Taking a Night-cap. 410
b Old Clock. 410
c Morning Call in 1800. 410
- 228 Hicks, Thos., New York, N. Y.
a Portrait. 410
b Jno. F. Gray, M. D. (portrait). 410
c General Meade (portrait). 410
- 229 Hicks, Thomas.—Mrs. MacDaniel (portrait). 410
- 230 Hinckley, T. H., Boston, Mass.—End of Chase. 410
- 231 Higgins, Geo. F., Boston, Mass.—Forest Interior, Adirondacks. 410
- 232 Hale, Ellen D., Boston, Mass.—Boy Reading. 410

Oil Paintings.

- 233 Handy.—Young Samaritan. 410
- 234 Horton, E. W., Boston, Mass.—
Double Poppies and Oats. 410
- 235 Hyatt, Miss D., Boston, Mass.—
"Stocks down." 410
- 236 Hunt, Wm. M., Boston, Mass.
a Drummer Boy. 410
b The Boot Black. 410
- 237 Inman, Henry.—Portrait of the late
Jas. H. Hackett in the character of Rip
Van Winkle. 410
- 238 Insley, Albert, New York, N. Y.
a Castle William. 410
b On the Hudson. 410
- 239 Irving, J. B.
a Cardinal Wolsey. 410
b Bookworm. 410
c The End of the Game. 410
- 240 Johnson, David, New York, N. Y.
a Old Man of the Mountain. Franconia
Notch, N. H. 410
b Brook Study. Warwick, Orange Co.,
N. Y. 410
c Night on the Housatonic. 410
- 241 Jones, H. Bolton, Baltimore, Md.—
The Ferry Inn (landscape). 410
- 242 Jerome, E. G., Hartford, Ct.—
"Honor the Brave." 410
- 243 Johns, Clarence M., Pittsburg, Pa.
"To Tubal Cain came many a one,
And each one prayed
For a strong steel blade."—Mackay. 410
- 244 John, Joseph, Philadelphia, Pa.—
Awaiting a Chance. 410
- 245 James, Fred., Philadelphia, Pa.—
Interior of American Smoking-Car. 410
- 246 Julio, E. B. D., New Orleans, La.—
Sugar-Cane Cutting and Loading. 410
- 247 Jarvis, M., Boston, Mass.—Por-
trait. 410
- 248 Johnson, Frost, New York, N.
Y.
a Street Scene—"A Thirsty Party." 410
b Good-night. 410
- 249 Johnson, Eastman, New York,
N. Y.
a Catching the Bee. 410
b Milton and his Daughters. 410
c Bo-Peep. 410
d What the Sea says. 410
e The Husking Bee. 410
f Kentucky Home. 410
g Sabbath Morning. 410
- 250 Jones, A.—Feeding Dolly. 410
- 251 Johnson, J. L.—String of Onions. 410
- 252 Kollock, M., New York, N. Y.
a Early Morning in the Mountains. 410
b Midsummer's Day in the Mountains. 410
- 253 Kensett, J. F.—New Hampshire
Scenery, Conway Valley. 410
- 254 Knocke, Wm. C., Chicago, Ill.
a The Captive brought into an Indian Vil-
lage. 410
b Falling Springs, Va. 410
c Portraits. 410
- 255 Kappes, Alfred, New York, N. Y.—
Waiting. 410
- 256 King, Geo. W., Philadelphia, Pa.—
Our Country "Peace." 410
- 257 Kendrick, D. T., Boston, Mass.—
Foggy Day at the Beach. 410
- 258 Kester, H., Mount Vernon, Ohio.
a Farragut at Mobile. 410
b Blind Piper. 410
c Chief-Justice Chase (portrait). 410
- 259 Kelley, Mrs. I. W., Adrian, Mich.
a Portrait. 410
b An Unexpected Meeting. 410
- 260 Kaufmann, Theodore, Washing-
ton, D. C.
a First Chapter of American History, a
series of ten paintings. 410
b Electricity an Object of Superstition. 410
c Admiral Farragut. 410
- 261 Kunath, Oscar, Munich, Bavaria.
a "He won't bite you." 410
b Still Life. 410
- 262 Knight, D. R., Philadelphia, Pa.—
Painting. 410
- 263 Lippincott, Wm. H., Philadelphia,
Pa.—"The Duck's Breakfast." 410
- 264 Lewis, Edmund D., Philadelphia,
Pa.—Exhibition Buildings from the East
Park. 410
- 265 Loop, Henry A., New York, N. Y.
a Aphrodite. 410
b Admiral Farragut (portrait). 410
- 266 Loop, Mrs. H. A., New York, N. Y.
—Portrait. 410
- 267 Lazarus, J. H., New York, N. Y.
a Mrs. Eleanor F. Bishop, the Florence
Nightingale of America. 410
b Fanny Hunt in "Midsummer Night's
Dream." 410
- 268 Lindemann, Carl F., Philadelphia,
Pa.
a Gentleman (portrait). 410
b Lady (portrait). 410
c Girl (portrait). 410
- 269 Lambdin, J. R., Philadelphia, Pa.—
Portrait. 410
- 270 Lea, Anna M., Philadelphia, Pa.
a Portrait. 410
b Portrait. 410
c Patrician Mother. 410
d St. Genevieve in the Forest. 410
- 271 Lang, Louis, Florence, Italy.—Re-
turn of the Market Boat, Capri. 410
- 272 Lawrie, Alexander, New York,
N. Y.
a Autumn in the Hudson Highlands. 410
b A Monk playing a Violoncello. 410
- 273 Leuce, Percival De, New York,
N. Y.—Interior Norristown, N. J. 410
- 274 Leland, Henry, Boston, Mass.—
Portrait. 410
- 275 La Farge, John, New York, N. Y.
a St. Paul Preaching. 410
b Portrait. 410
c Wreath of Flowers. 410
d Hollyhocks. 410
e Water Lilies. 410
f Study of Fog. 410
g Bishop Berkeley's Rock, Newport. 410
- 276 Lydston, F. A., Milwaukee, Wis.
a Portrait. 410
b Portrait. 410
- 277 Lambdin, Geo. C., Philadelphia,
Pa.
a On a Summer Sea. 410
b Roses near a Wall. 410
c Roses in a Vase. 410
- 278 Le Clair.—Parke Godwin (Portrait).
410
- 279 Longfellow, E. W., Boston, Mass.—
Old Mill at Manchester, Mass. 410

Oil Paintings.

- 280 Marshall, Wm. E., New York, N. Y.—Head of Christ. 410
- 281 Mulvaney, John, New York, N. Y.—Trial of a Horse Thief before a Western Justice. 410
- 282 Mayer, Frank B., Baltimore, Md.
a The Attic Philosopher. 410
b The Continentals. 410
- 283 Macy, W. E., Munich, Bavaria.—Landscape. 410
- 284 Miller, Chas. H., New York, N. Y.
a Returning to the Fold. 410
b Old Mill at Springfield, L. I. 410
c High Bridge from Hudson River, N. Y. 410
d Old Oaks at Creedmoor, N. Y. 410
e Sunset on Jamaica Bay, N. Y. 410
f A Long Island Homestead, N. Y. 410
g The Road to the Mill. 410
h Sunset at Queens, N. Y. 410
- 285 Maerz, A. J., Buffalo, N. Y.—Charity. 410
- 286 Montalant, J. O. de, Rome, Italy.
a Constantinople. 410
b Acropolis, Athens. 410
- 287 Machen, Wm. H., Toledo, Ohio.
a Dead Game, Ruffled Grouse. 410
b Dead Game, Prairie Chickens. 410
- 288 Moran, Edward, New York, N. Y.
a Coming Storm over New York Bay. 410
b Minot Ledge Light. 410
c The Hawk's Nest. 410
- 289 Melrose, Andrew, New York, N. Y.
a Past and Present 1609-1876. View of New York. 410
b Tower Hill, Guttenberg, N. J. 410
- 290 Morrell, Mrs. I. Robinson, Washington, D. C.
a Washington Welcoming Provision Train, 1778. 410
b First Battle Won by the Puritans. 410
- 291 Moran, P., Philadelphia, Pa.
a The Return of the Herd. 410
b Settled Rain. 410
- 292 Minor, Robt. C., New York, N. Y.
a Evening. 410
b Daybreak. 410
- 293 Morand, Aug., Germantown, Pa.,—Washington (portrait). 410
- 294 Moore, H. H., New York, N. Y.—Almech, a Dream of the Alhambra. 410
- 295 Münster, W., Newport, R. I.—Stolzenfels Castle on the Rhine. 410
- 296 Maynard, Geo. W., New York, N. Y.
a "Vespers." 410
b "1776." 410
- 297 Maynicke, Miss Emma, New York, N. Y.
a Flower Girl. 410
b Head of St. Paul. 410
- 298 Marchant, E. D., Philadelphia, Pa.
a Hon. Henry C. Carey (portrait). 410
b Hon. Wm. H. Allen (portrait). 410
c William J. Mullen (portrait). 410
- 299 Miffin, Lloyd, Columbia, Pa.
a Scene from "Macbeth." 410
b Rome from Marino. 410
- 300 McDonald, M. J.—Head of Shepherd Dog. 410
- 301 Moran, Thomas, Newark, N. J.
a The Mountain of the Holy Cross. 410
b "Piercely the red sun descending burned his way along the heavens." 410
c Hot Springs of the Yellowstone. 410
d Hiawatha. 410
e Dream of the Orient. 410
- 302 MacKnight, S. R.
a When the Cat's away, etc. 410
b Child (portrait). 410
- 303 Mayer, F. B.—Love and Melancholy. 410
- 304 Meyer, H.—Past and Present of the U. S. 410
- 305 McEntee, Jervis, New York, N. Y.
a Woods of Ashokan. 410
b Winter. 410
c Frosty Morning. 410
d Virginia. 410
e Saturday Afternoon. 410
f October Afternoon. 410
g Mill. 410
h November. 410
i Autumn. 410
- 306 Mathews, Wm.—Globe of Fishes. 410
- 307 Mathews, W. F.—Dahlias. 410
- 308 Moore, H. K.—A Moorish Merchant. 410
- 309 Markham, C. C.—My Grandmother. 410
- 310 Magrath, W.
a The Mussel Gatherers. 410
b On the Hillside. 410
- 311 Martin, H.—Lake.
a Little Girl. 410
b Little Boy. 410
c Irish Thatched Cottage. 410
- 312 Monks, J. A., Boston, Mass.—Apple Trees in Blossom. 410
- 313 Martin, Miss E., Boston, Mass.
a Flowers on Panel. 410
b Flowers on Panel. 410
- 314 Millet, Frank D., Boston, Mass.
a Lady in Costume of 1740. 410
b In the Bay of Naples. 410
c Turkish Water Seller. 410
- 315 McMurtrie, L. G., Boston, Mass.
a Rhododendron. 410
b Geranium. 410
- 316 Murtland, M. M., Philadelphia, Pa.
a Autumn Leaves. 410
b Grandfather's Bible. 410
- 317 Magrath, New York, N. Y.—Irish Thatched Cottage. 410
- 318 Noble, Thomas S., Cincinnati, Ohio.—Hard Times. 410
- 319 Niffen, Paul, Adams, N. Y.—Boy's Dream. 410
- 320 Newberg, Rose.—Tuberose, etc. 410
- 321 Nicol, J. C., New York, N. Y.—Moonrise. 410
- 322 Newell, Hugh, Philadelphia, Pa.
a Picture. 410
b Picture. 410
- 323 Norton, W. E., Boston, Mass.—Fog on the Grand Banks. 410
- 324 Oertel, Rev. Johannes A., Lenoir, N. C.
a The Shadow of the Rock. 410
b Christ, the Rock of our Salvation. 410
- 325 Ogelvie.—In the Woods. 410

Oil Paintings.

- 326 Odenheimer, M. B., New York, N. Y.—Guinevere. 410
- 327 Ottinger, Geo. M., Salt Lake City, Utah.—Montezuma Receiving News of the Landing of Cortez. 410
- 328 Pohle, H., New York, N. Y.—Landscape. 410
- 329 Prosser, W. F., for Fisk University.
a Jubilee Singers (portraits). 410
b Wilberforce, the Emancipationist (portrait). 410
- 330 Page, Wm., New York, N. Y.—Farragut entering Mobile Bay. 410
- 331 Phillips, Moro, Philadelphia, Pa.—The Hawking-Boy Page Waiting for his Mistress. 410
- 332 Parker, John A., Brooklyn, N. Y.—Twilight in the Adirondacks. 410
- 333 Perdicaris, Ion., Trenton, N. J.
a "Resurgamus" (Combat of Life, Terror of Death, and Triumph of Immortality).
b Moorish Interior. 410
- 334 Phillips, S. H., Paris, Ill.—The original "Arkansas Traveler," from Life. 410
- 335 Pawel, F.—Emancipation Proclamation, or the Assembling of Nations. 410
- 336 Pettit, Geo. W., Philadelphia, Pa.—Cremation of Julius Cæsar. 410
- 337 Pine, Theodore.—Mrs. J. W. Doane (portrait). 410
- 338 Platt, Geo. W., Philadelphia, Pa.—Corner on Cats. 410
- 339 Perry, E.
a The Weaver. 410
b Kept In. 410
c A Month's Darning. 410
d Quilting. 410
- 340 Perry, Ann.—Anne Hathaway's Kitchen. 410
- 341 Page, Wm., New York, N. Y.—Shakspeare. 410
- 342 Perry.—Franklin. 410
- 343 Pape, A., Jr., Boston, Mass.—English Pheasant. 410
- 344 Porter, S. C., Philadelphia, Pa.—Study of a Child. 410
- 345 Pearce, Chas. Sprague, Boston, Mass.—L'Italliene. 410
- 346 Porter, Benjamin C., Boston, Mass.
a The Hour Glass. 410
b Lady (portrait). 410
- 347 Parker, Edgar, Boston, Mass.—John G. Whittier. 410
- 348 Quartley, Arthur, Baltimore, Md.—Marine View. 410
- 349 Ream, Morston, New York, N. Y.—Still Life, Fruit Table. 410
- 350 Robbins, Francis L., Philadelphia, Pa.—Study of an old Woman's Head. 410
- 351 Rosenthal, Max.
a Firemen's Parade, 16th October, 1866. 410
b Proclamation of Emancipation. 410
- 352 Ritchie, A. H., Brooklyn, N. Y.—Death of President Lincoln. 410
- 353 Rosenthal, Toby E., Munich, Bavaria.
a Elaine. 410
b Salome. 410
c A False Alarm. 410
- 354 Robjohns, Francis R., Newcastle, Pa.
a "Queen of Hearts." 410
b Beautiful October (landscape). 410
c La Belle Riviere (landscape). 410
d Interior View of Rolling Mill. 410
e Interior View of Steel Casting Mill. 410
f Interior View of Glass Making. 410
g Exterior View of Ship Building. 410
- 355 Read, T. Buchanan (deceased).
 Sheridan's Ride. 410
- 356 Rose, A. L. de.—Portrait of Davy Crockett. 410
- 357 Rafter, Susie L. J., New York, N. Y.—String of Onions. 410
- 358 Ried, H. V., Riedenburg.
a Penn's Treaty with the Indians. 410
b Portrait of a boy. 410
- 359 Ream, C. P., New York, N. Y.—Chas. Sumner (life-size portrait). 410
- 360 Rothermel, P. F., Philadelphia, Pa.
a Christian Martyrs in the Colosseum. 410
b Kenilworth. 410
c Sicilian Vespers. 410
d Macbeth. 410
e Hypatia. 410
f The Virtuoso. 410
g The Landsknecht. 410
h Battle of Gettysburg. 410
- 361 Rice, Miss Ettie L., New York, N. Y.—View in Central Park, N. Y. 410
- 362 Richards, Wm. T., Philadelphia, Pa.—The Wissahickon. 410
- 363 Randle, Frederick, Philadelphia, Pa.—Flowers. 410
- 364 Roome, William, New York, N. Y.—Sunset, California Coast. 410
- 365 Robbins, H. W.—Study from Nature. 410
- 366 Ruch, Philadelphia, Pa.—Crayon Portrait. 420
- 367 Robbins, Ellen, Boston, Mass.
a Pansies. 410
b Vase of Flowers. 410
c English Primroses. 410
- 368 Robinson, Thos., Boston, Mass.
a New England Farmer. 410
b Sheep in Pasture. 410
c Bulls' Heads. 410
d Old Team. 410
e Dog's Head. 410
- 369 Stancliff, J. W., Hartford, Conn.—New England Coast. 410
- 370 Spencer, Miss Lilly M.
a Truth Unveiling Falsehood. 410
b Two Fancy Portraits. 410
c Cabinet Pictures. 410
- 371 Stanley, D. M., Detroit, Mich.—Trial of Red Jacket, the last Sachem of the Six Nations. 410
- 372 Smith, Russell, Jenkintown, Pa.
a Mount Vernon in 1836. 410
b Cave, Cheltenham Hills. 410
- 373 Sonntag, Wm. L., New York, N. Y.—Sunset in the Wilderness. 410
- 374 Sherk Brothers, Brooklyn, N. Y.—The Nubian Story-Teller. 410
- 375 Story, Geo. H., New York, N. Y.
a The Young Student. 410
b The Young Mother. 410
c Echoes of the Sea. 410
- 376 Sand, Max, New York, N. Y.—Twilight in the American Woods. 410

Oil Paintings.

- 377 Spang, William, Philadelphia, Pa.
—The Dawn of the New Era. 410
- 378 Seligman, Mrs. Emma, Tarrytown, N. Y.
a Love and Pride. 410
b On the Alert. 410
- 379 Smith, Mary, Philadelphia, Pa.—
"Chick and Chicks." 410
- 380 Smith, Xanthus, Philadelphia, Pa.
—"Kearsarge" and "Alabama." 410
- 381 Shaw, Annie C.—Illinois Prairie. 410
- 382 Smith, T. Henry, Philadelphia, Pa.
a "Mind and Matter." 410
b "Origin of Sculpture." 410
c Portrait. 410
- 383 Schussele, C., Philadelphia, Pa.
a Zeisberger preaching to the Indians. 410
b The Iron Worker. 410
c The Soldier's last Will. 410
d Clear the Track. 410
e The Man of Progress of America. 410
f Alsatian Fair. 410
g Sunday Morning in Alsace. 410
h Prince Arthur and Hubert. 410
i Queen Esther. 410
- 384 Smith, Thomas L., New York, N. Y.
a Deserted House. 410
b Eve of St. Agnes. 410
- 385 Schaerff, I. W., Philadelphia, Pa.
a Poesy and Love. 410
b Cassandra. 410
c Judith. 410
- 386 Shearer, C. H., Tuckerton, Pa.—
Head Water of the Ontelaunee. 410
- 387 Sword, James B., Philadelphia, Pa.
—Trenton Falls. 410
- 388 Smillie, Geo. H., New York, N. Y.
—A Lake in the Woods. 410
- 389 Sharps, Isaac S., New Hampton, N. J.—Sunlight at the Delaware Water Gap in August. 410
- 390 Simon, Herman, Philadelphia, Pa.
—Steady. 410
- 391 Shirlau, Walter, Munich, Bavaria.
a Sheepshearing in the Southern part of Bavaria. 410
b Tone Test. 410
c Good-morning. 410
- 392 Strong, Jas. D., Jr., Munich, Bavaria.
a Monk (portrait). 410
b Study Head. 410
c Young Man Smoking (portrait). 410
- 393 Stevenson, Bella F., Peoria, Ill.—
Pharaoh's Horses. 410
- 394 Skirmunt, Simon de, Brindisi, Italy.
a A Festival in Palace Colonna, Rome. 410
b A Member of the Council of Ten, Venice. 410
c Reflection. 410
- 395 Shade.—Tantalizing. 410
- 396 Sillstedt.—Portrait. 410
- 397 Shattuck, New York, N. Y.
a White Hills. 410
b Lake Champlain. 410
c Sheep and Cattle. 410
- 398 Scott, W. W.
a Marguerita Moore. 410
b Daughter of Columbia. 410
c Getting Dry after the Bath. 410
d An Old Salt. 410
- 399 Silva, F. A.
a New York Harbor. 410
b Brass Rock. 410
- 400 Stewart, J. L., Philadelphia, Pa.
a Miguel. 410
b Marie. 410
- 401 Smith, T. H., Philadelphia, Pa.
a M. Drinker (portrait). 410
b Henry C. Carey (portrait). 410
c Late Jos. Harrison, Jr. (portrait). 410
d Mind and Matter. 410
- 402 Spieler, Chas. H., Philadelphia, Pa.
—First City Troop. 410
- 403 Sartain, Emily, Philadelphia, Pa.
—The Reproof. 410
- 404 Shapleigh, F. H., Boston, Mass.
a On the Seine. 410
b At Kenilworth, England. 410
- 405 Stokes, John, Boston, Mass.—Blue Jay. 410
- 406 Smith F. Hill, Boston, Mass.
a Sunset on the Guidecca, Venice. 410
b Morning on the Lagoon, Venice. 410
- 407 Story, Annie B., Boston, Mass.
a Cherokeee Rose. 410
b Carnation. 410
- 408 Snowe, Francis, Boston, Mass.—
Cloudy Day. 410
- 409 Staigg, R. M., Boston, Mass.
a Chestnut Gathering. 410
b Empty Nest. 410
c Cornice Road, Italy. 410
d Young Lady. 410
- 410 Strain, D. J., Boston, Mass.—Ideal Head. 410
- 411 Tensfeld, John, Brooklyn, R. I.—
"Good-night." 410
- 412 Trego, J. R., Detroit, Mich.
a In the Pasture. 410
b First Lesson. 410
- 413 Taft, Richard, New Hampshire.—
Old Man of the Mountain 410
- 414 Treat, O. C., Orian, Mich.
a The Young Mother. 410
b Winter's Evening Twilight. 410
- 415 Thompson, A. W., New York, N. Y.
a Desolation, St. Cloud. 410
b The Sands. 410
c Virginia in Olden Time. 410
- 416 Thorp, A. C., Madison, Wis.
a Legends of the Lakes, 1. 410
b Legends of the Lakes, 2. 410
c Legends of the Lakes, 3. 410
d Legends of the Lakes, 4. 410
- 417 Tompkins, Miss Clementina, Paris, France.
a Il Piccolo Musico. 410
b Un Debut Artistique. 410
- 418 Thompson, Harry I., New Haven, Conn.
a Col. Juan Lewis (portrait). 410
b Erastus Cutler (portrait). 410
c A lady (portrait). 410
d Portrait. 410
- 419 Tait, John R., Philadelphia, Pa.
a Summer (landscape). 410
b Autumn (landscape). 410
c After the Rain (landscape). 410
- 420 Trumbull, G., Hartford, Conn.—A Critical Moment. 410
- 421 Trotter, Newbold H., Philadelphia, Pa.—Wounded Buffaloes pursued by Prairie Wolves. 410

Oil Paintings.

- 422 Thomas, Jos. Stirling, Philadelphia, Pa.—Still Life. 410
- 423 Tiers, M. C., New York, N. Y.—American Centennial Progress. 410
- 424 Tenney, U. D., New Haven, Conn.—Gen. John Stark (memorial portrait). 410
- 425 Tuttle, C. F., Chicago, Ill.—Miss Wright (portrait). 410
- 426 Thomson, Henry, Paris, France.—Charlotte Corday writing on the eve of her execution. 410
- 427 Thurlow, Mrs. S. W., Philadelphia, Pa.—Harbor of Rhodes (landscape). 410
- 428 Thorpe, T. B.—“Westward the course of Empire takes its way” (landscape). 410
- 429 Tiffany, Louis C., New York, N. Y.
a Snake Charmer at Tangiers, Africa. 410
b A Guard at the Prison Gate, Tangiers. 410
c A Booth in Cairo. 410
- 430 Thompson, Jerome.—The Old Oaken Bucket. 410
- 431 Townsend, Chas. E.—Lion and Lioness. 410
- 432 Thomas, Mrs.
a Phlox and Larkspur. 410
b Flowering Almond. 410
- 433 Tait, A. F.—In the Adirondacks. 410
- 434 Thorn.
a Going to Church. 410
b Panel Decoration. 410
c Panel Decoration. 410
- 435 Thompson, Albert, Boston, Mass.—View near Honfleur, Normandy. 410
- 436 Tuckerman, S. Salsbury, Boston, Mass.
a U. S. Frigate Constitution escaping from the British, July, 1812. 410
b Beach at Hastings, England. 410
- 437 Ulke, Henry, Washington, D. C.—Charles Sumner (portrait). 410
- 438 Volk, Douglas, Chicago, Ill.
a Vanity. 410
b View in Brittany, France. 410
- 439 Volkmar, Chas., Jr., Baltimore, Md.—A Passing Shower. 410
- 440 Vollmering, Joseph, New York.
a View of New York. 410
b View on the Hudson. 410
- 441 Venino, Franz, New York, N. Y.
a King Lear and Cordelia in Prison. 410
b The Last Moment of Carthage. 410
- 442 Vedder, Miss Elihu, Rome, Italy.—Greek Actor's Daughter. 410
- 443 Van Etten, Kruseman, New York, N. Y.
a Scene on the Upper Ausable River. 410
b The Grove in the Heath. 410
c Solitude. 410
d Clearing off. 410
- 444 Weir, Robert W., West Point, N. Y.—Embarkation of the Pilgrims from Delft Haven, Holland, in 1620. 410
- 445 Wilson, Oregon, New York, N. Y.—Woman's Devotion, Battle of Winchester. 410
- 446 Witmar, C. F., Philadelphia, Pa.—Under the Gaslights. 410
- 447 Waters, Geo. W., Elmira, N. Y.—Franciona Notch, White Mountains, New Hampshire. 410
- 448 Weber, Philip, Philadelphia, Pa.—Twilight (landscape). 410
- 449 Waterman, M., Providence, R. I.—Lemuel Gulliver in Lilliput. 410
- 450 Williams, Mrs. E. F., Philadelphia, Pa.—Girl (portrait in pearletta). 410
- 451 West, Peter B., Cleveland, Ohio.—Game Piece from Nature. 410
- 452 Wiggeland, D., Salt Lake City, Utah.—The Gipsy Camp, Salt Lake City. 410
- 453 Whiteman, Mary Hettie, Philadelphia, Pa.
a Samuel G. Ruggles (portrait). 410
b Grand Duke Alexis (crayon portrait). 410
- 454 Weber, Carl.
a Morning in the Alleghany Mountains. 410
b The Reichenbach in Switzerland. 410
- 455 Way, A. J. H., Baltimore, Md.
a Bunch of Muscat Grapes. 410
b Damascus Grapes. 410
- 456 Woodwell, Jos. R., Pittsburg, Pa.—Venice. 410
- 457 Wyant, A. H., New York, N. Y.
a A Midsummer's Retreat. 410
b Looking Seaward, near Killarney. 410
- 458 Way, Agnes C., Pittsburg, Pa.—Apples. 410
- 459 Way, C. Granville, Paris, France.—Horses' heads and stable. 410
- 460 Wall, Wm. A., New Bedford, Mass.
a On the Accushnett, Massachusetts. 410
b Brook, Dartmouth, Massachusetts. 410
c Clarke's Cove, Buzzards' Bay, Mass. 410
- 461 Winner, W. E., Philadelphia, Pa.
a Portrait. 410
b Portrait. 410
- 462 Wood, Geo. B., Jr., Germantown, Philadelphia.
a Freddy Flechenstein's Shop, Germantown. 410
b John Krider's Shop, Second and Walnut, Philadelphia. 410
c Civil Rights. 410
d The Lucky Sportsman. 410
- 463 Winters, Mrs. David, Philadelphia, Pa.
a Autumnal Wood Scene. 410
b The Hibiscus. 410
c Daisies and Cardinal Flowers. 410
d Roadside View at Kennett, Pennsylvania. 410
- 464 Weir, John F., West Point, N. Y.
a The Gun Foundry. 410
b Column of St. Mark, Venice. 410
c The Confessional. 410
d Portrait. 410
e Lago Maggiore, Italy. 410
- 465 Willard, Wm., Sturbridge, Mass.—Charles Sumner (portrait). 410
- 466 Webb, Francis R., Philadelphia, Pa.—Expectancy. 410
- 467 Winter, I., Flushing, L. I.—Inspiration of Music. 410
- 468 Willard, A. M., Cleveland, Ohio.—Yankee Doodle. 410
- 469 Waller, Frank, New York, N. Y.—Tombs of the Caliphs, near Cairo. 410
- 470 Wiles, L. M., New York, N. Y.—American Scenery. 410

Oil Paintings, Water Colors.

- 471 White, Edwin, New York, N. Y.
a Signing of the Compact on Board the Mayflower. 410
b The New England Cider-Mill. 410
c The Barjello. 410
d Sabbath of the Emigrant. 410
e The Antiquary. 410
- 472 Weilenbeck, Frederick R., Philadelphia, Pa.
a The Wild Hunter. 410
b Brazil Swamps. 410
- 473 Whitefield, E., Lowell, Mass.—Views of Massachusetts cities. 410
- 474 Whittredge, Worthington, New York, N. Y.
a The Window. 410
b Old Hunting-Ground. 410
c One Hundred Years Ago. 410
d Platte River. 410
e Home by the Sea. 410
f Woods of Ashakar. 410
- 475 Waitz, Richard, Boston, Mass.
a Miles Standish's Courtship, 1. 410
b Miles Standish's Courtship, 2. 410
c Portrait. 410
d Portrait. 410
e America. 410
f Portrait miniature. 410
g Figures in miniature. 410
- 476 Wharton, Philip F., Philadelphia, Pa.
a Perdita. 410
b A Pastoral from Winter's Tale. 410
- 477 Welch, Thaddeus, Munich, Bavaria.—Landscape, with figures. 410
- 478 West, Caroline, Philadelphia, Pa.—Rocks at Nahant. 410
- 479 Ward, E. M.—Washing Clothes. 410
- 480 Warners.—Lilies. 410
- 481 Wild, Hamilton, G., Boston, Mass.—Banks of the Nile. 410
- 482 Weeks, E. L., Boston, Mass.—Arab Story Teller. 410
- 483 Waterman, M., Boston, Mass.—Gulliver in Lilliput. 410
- 484 Waters, S. C., Philadelphia, Pa.—Game. 410
- 485 Waugh, T. B., Philadelphia, Pa.
a Lost Jewels Found. 410
b An Egyptian. 410
c Girl (portrait). 410
d Gen. Grant (portrait). 410
e Portrait. 410
- 486 Wild, H., Boston, Mass.—A Dandy of Grenada. 410
- 487 Wiesman, W. H., Philadelphia, Pa.—Cape Ann Rocks. 410
- 488 Williams, J. L., Philadelphia, Pa.—Near May Field, England. 410
- 489 Wright, Geo., Philadelphia, Pa.—One Too Many. 410
- 490 Bliss, Lucia S., Jamaica Plain, Mass.
a Painting of Flowers. 411
b Painting of Flowers. 411
c Painting of Flowers. 411
d Painting of Flowers. 411
e Painting of Flowers. 411
- 491 Bridges, Miss F., Brooklyn, L. I.
a Summer. 411
b Winter. 411
c King-Fisher among the Reeds. 411
- 492 Brown, J. Henry, Philadelphia, Pa.
a Gov. Henry Bohlen (ivory miniature). 411
b Charles Macalester (ivory miniature). 411
c Picture of a Lady (ivory miniature). 411
d Hon. Jas. Buchanan (ivory miniature). 411
e Picture of a Lady (ivory miniature). 411
f Rev. John Chambers (ivory miniature). 411
g Com. R. F. Stockton (ivory miniature). 411
h Picture of Gentleman (ivory miniature). 411
- 493 Baldwin, A. H., New York, N. Y.
a An Unskilful Gardener. 411
b Desdemona's House at Venice. 411
- 494 Bellows, A. F., New York, N. Y.
a Study of a Head. 411
b Autumn Wood. 411
c Safely Landed. 411
d Sunday in New England. 411
e Sunday in Devonshire. 411
- 495 Bricher, A. I.
a Summer Morning. 411
b Foggy Morning. 411
c Gathering Water Lilies. 411
d Cliffs at Cape Ann. 411
- 496 Brown, J. G., New York, N. Y.
a The Rustic Milliner. 411
b Watering-Place Pleasures. 411
c Got a Nibble. 411
d Curling in the Central Park, New York. 411
- 497 Burling, Gilbert, New York, N. Y.—Owl and Ducks. 411
- 498 Boughton, G. H.—Normandy Caught in a Shower. 411
- 499 Binling, G.—Study of Birds. 411
- 500 Brown, G. S., Boston, Mass.
a Trees. 411
b Anicia. 411
c Venice. 411
- 501 Burdick, H. R., Boston, Mass.—Head. 411
- 502 Brunn, Geo. L., Boston, Mass.—Water color paintings. 411
- 503 Brown, W.—Putting His Foot into it. 411
- 504 Brucken, A. F.
a Water Lilies. 411
b Cape Ann. 411
c Grand Menan. 411
- 505 Colman, S.
a Rome, Looking Down the Tiber. 411
b Corpus Christi Day. 411
c The Mosque of Sidi Haloni, Algeria. 411
d Twilight, Gilead, Maine. 411
e Street Scene, Gaen, Spain. 411
f Street Scene, Morlaix, Brittany. 411
g The Arch of Constantine, Rome. 411
h Distant View of Rome. 411
i Street Scene, Dinan. 411
- 506 Carson, Mrs. Caroline, Rome, Italy.—Group of Flowers. 411
- 507 Cortelyou, G. V., New Brunswick, N. J.—Soliloquy of Friar Pacificus, from Longfellow's Golden Legend. 411
- 508 Derrick, E. I. M., Paterson, N. J.—Design for a monument. 411
- 509 Darley, F. O. C., New York, N. Y.—Street Scene in Rome. 411
- 510 Durand, F. I., New York, N. Y.—Falls on the Ausable, Keene, N. Y. 411

Water Colors.

Water Colors.

- 511 Darrah, S. T., Boston, Mass.—After the Storm. 411
- 512 Elten, Kruseman, Van, New York, N. Y.
a Evening, Long Island Sound. 411
b Autumn in the White Mountains. 411
- 513 Eaton, J. O. 411
- 514 Elton, R. Van.
a Autumn. 411
b Evening. 411
- 515 Faber, Hermann, Philadelphia, Pa.—Daniel in the Lion's Den. 411
- 516 Falconer, J., Brooklyn, L. I.
a Cross Street, Boston, April, 1864. 411
b Chatham Street, New York, April, 1855. 411
c South Second Street, Philadelphia, April, 1862. 411
d House where Jefferson wrote the Declaration of Independence, Philadelphia, 1854. 411
e Gov. Wm. Penn's Mansion, South Second Street, Philadelphia, 1864. 411
- 517 Fredericks, Alf., New York, N. Y.
a Romeo and Juliet. 411
b The Scarecrow. 411
- 518 Gilbert, Sarah D., Brooklyn, N. Y.
a Leaves and flowers. 411
b Flowers of the poets. 411
- 519 Graham, Wm., Rome, Italy.—Angle of the Ducal Palace, Venice. 411
- 520 Gifford, R. S., New York, N. Y.
a Venetian Companion. 411
b The Roc's Egg. 411
c Early Morning in Morocco. 411
d Egyptian Fountain. 411
e Cairo. 411
- 521 Herrick, H. W., Manchester, N. H.
a Gen. Stark as Trapper Captured by Indians. 411
b Gen. Stark's Last Charge at Bennington. 411
c Gen. Stark at Trenton. 411
d Gen. Stark at Bunker Hill. 411
- 522 Homer, W.
a A Flower for the Teacher. 411
b In the Garden. 411
c The Busy Bee. 411
d The Trysting Place. 411
e "How Many Eggs." 411
- 523 Hart, William, Brooklyn, N. Y.—Mount Madison. 411
- 524 Hobbs, Isaac M., & Son
a Ravensville Seminary. 411
b Capital of Illinois. 411
c Mead Memorial Monument. 411
- 525 Hill, J. W., New York, N. Y.
a Quail. 411
b Hollyhocks. 411
c The Leader's Call. 411
d New England Autumn. 411
e An Old Connecticut Bridge. 411
f A Fresh Water Sailor. 411
- 526 Hyatt, Mrs. Delia, Boston, Mass.—Stork Tower, Rutlingen, Germany. 411
- 527 Hill.
a Landscape (water color). 411
b Blackberries. 411
- 528 Harnron, A.—Violets. 411
- 529 McDonald, Miss M. J., New York, N. Y.
a Roses. 411
b The Art Student. 411
c Head of a Shepherd Dog. 411
d Portrait. 411
e Primroses. 411
f Fruit. 411
- 530 Magrath, W., New York, N. Y.
a Nora. 411
b The Galway Girl. 411
c Gran'dad's Visit. 411
- 531 Moran, Thomas, Newark, N. J.
a The Hot Spring of the Yellowstone River. 411
b A Pah-Ute Encampment. 411
c Tower Falls from above Yellowstone. 411
d Illustrations in India ink. 411
e Solitude. 411
- 532 Mungoe, George, Philadelphia, Pa.—Painting. 411
- 533 Miller, E. F., Philadelphia, Pa.
a Evening. 411
b Winter. 411
- 534 Nicoll, I. C., New York, N. Y.
a On the Gulf of St. Lawrence. 411
b Rising Fog. 411
c The Deserted Farm. 411
d Moonrise. 411
e A Calm Morning. 411
- 535 Robertson, Archibald, New York, N. Y.
a Sketch of Gen. George Washington. 411
b Sketches in and around New York. 411
- 536 Richards, William T., Philadelphia, Pa.
a Paradise, Newport. 411
b Sand-hills, Atlantic City. 411
- 537 Robbins.
a Autumn. 411
b Old Bridge. 411
- 538 Satterlee, Walter, New York, N. Y.
a One Hundred Years Ago. 411
b Far-away Thoughts. 411
c Marguerite. 411
- 539 Stoppel, H., New York, N. Y.
a Female Resting After Bath. 411
b The Three Sisters. 411
- 540 Scott, William Wallace, New York.
a Getting Dry after the Bath. 411
b An Old Salt. 411
- 541 Spieler, Chas. H., Philadelphia, Pa.—The First City Troop of Philadelphia. 411
- 542 Sterling, Miss Charlotte H., Gambier, Ohio.
a Oak Leaves. 411
b Maple Leaves. 411
- 543 Smillié, J. D., New York, N. Y.
a On the Ausable River, Adirondacks. 411
b A Scene, Race on the Western Plains. 411
- 544 Silva, F. A., New York.
 Brace's Rock. 411
- 545 Schumaker, J. G., Brooklyn, N. Y.—French Views. 411
- 546 Scott, William Wallace, New York, N. Y.
a A Fair Daughter of Columbia. 411
b Margaretta B. Moore (miniature). 411
- 547 Symington, James, New York, N. Y.—Dolly's Breakfast. 411
- 548 Smith, F. H., New York, N. Y.
a Outdoor Study. 411
b Brook Study. 411
c In the Darkening Hour. 411
- 549 Tiffany, L. C., New York, N. Y.
a As Good as New. 411
b Lazy Life in Morocco. 411
c The Old and New Mosques, Cairo. 411
d Street Scene, Cairo. 411
e Dignity in Servitude. 411
f Street Scene, Dinan. 411

Water Colors.

- 550 Tompkins, Abigail B., Newark, N. J.—Snow Scene in Woodside, Newark, N. J. 411
- 551 Wood, Geo. B., jr., Philadelphia, Pa.
a The Old Tinker. 411
b Rittenhouse Town. 411
- 552 Wood, T. W.
a Contraband. 411
b The Leader's Call. 411
c The Village Post-office. 411
- 553 Hoefel, Ferdinand, St. Louis, Mo.—Oil Painting on glass. 413
- 554 Martin, Mrs. L. E., Boston, Mass.
a Flowers on black panel. 413
b Paintings on porcelain. 413
- 555 Bressan, Giovanni, Philadelphia, Pa.
a Lady (portrait). 420
b Gentleman (crayon drawing portrait). 420
- 556 Bartlett, G. H., Boston, Mass.—Pen and ink drawings. 420
- 557 Darley, F. O. C., Claymont, Del.
a Puritans barricading their house against a sudden attack by Indians. 420
b A merciful man is merciful to his beast. 420
- 558 Edgar, Miss Lydia, Philadelphia, Pa.
a Portrait on photographic vase (crayon). 420
b Portrait on photographic vase (crayon). 420
c Portrait on photographic vase (crayon). 420
d Portraits in crayon. 420
- 559 Ellis, S. A.—Portrait of a child (crayon). 420
- 560 Fowle, Alonzo H., Grand Rapids, Mich.—Pictures (pencil drawings). 420
- 561 Greator, Mrs. Eliza, New York.
a Drawings of Old New York buildings of 1776. 420
b Drawings of Colorado scenery in 1872 (pen and ink). 420
- 562 Hemmüller, Wm., New York, N. Y.
a Pegasus (crayon drawings). 420
b Cats at Play (crayon drawings). 420
c Horse's Head (crayon drawing). 420
- 563 Kurtz, William, New York, N. Y.—Portraits in crayon. 420
- 564 Munzig, G. C., Boston, Mass.—Ideal head. 420
- 565 Reed, H., Boston, Mass.—Ideal head. 420
- 566 Rüger, Julius, Brooklyn.—Horace Greeley (crayon drawing portrait). 420
- 567 Robertson, Archibald, New York, N. Y.—Pen studies, in and around New York. 420
- 568 Stencil, G. A., Boston, Mass.—Washington. 420
- 569 Stanhouse, Wm.—Pen and ink drawings. 420
- 570 Vasseud, L., Boston, Mass.—A Lady (crayon portrait). 420
- 571 Veninè.—Fall of Carthage (crayon). 420
- 572 Andrews, J., Boston, Mass.—Pilgrims Landing. 421
- 573 Brum, Geo. L., Boston, Mass.—Copper-plate etchings. 421
- 574 Burt, C., and Hinshlewood, R., New York, N. Y.—The Pet Lamb, after Eastman Johnson. 421
- 575 Durand, A. B., New York, N. Y. 421
- 576 Edgar, Miss Lydia, Philadelphia, Pa.
a Three Studies from Nature—II Papagaio, Musidora, Ariadne. 421
b Chas. Carroll. 421
c J. Trumbull. 421
d Chief Justice Marshall. 421
- 577 Forbes, Colonel.—Etchings. 421
- 578 Foreign Artists.—Engravings. 421
- 579 Graphic Company, New York, N. Y.—Portraits, views, landscapes, buildings, etc., engraved by the Graphic process. 421
- 580 Hollyer, Samuel, Guttenburg, N. J.
a Charles Dickens in his Study. 421
b The Gleaner. 421
c Flaw in the Title. 421
d Portraits. 421
- 581 Marshall, W. E.
a Engraving, Abraham Lincoln. 421
b Engravings. 421
- 582 Moran, P., Philadelphia, Pa.
a Winter (etching on copper). 421
b Summer (etching on copper). 421
c Return of the Herd (etching on copper). 421
d A Study (etching on copper). 421
- 583 McRae, John C., New York, N. Y.
a First in Peace. 421
b Raising the Liberty Pole, 1776. 421
c The Day we celebrate, 1876. 421
- 584 Miffin, Lloyd, Columbia, Pa.—Etchings from original designs. 421
- 585 Ritchie, A. H., Brooklyn.
a Preparing Moses for the Fair. 421
b Lady Washington's Reception, (Eng.). 421
- 586 Muller.—Wood engravings. 422
- 587 Ferris, Stephen J., Philadelphia, Pa.—Retreat from Lexington (etching on copper). 423
- 588 Camp, J. H., Philadelphia, Pa.—Lithographic drawing of Main Exhibition Building and Machinery Hall. 424
- 589 Graff, Bros., Philadelphia, Pa.—Floral cards. 424
- 590 American Photo-Relief Printing Co., Philadelphia, Pa.—Transparencies on glass by Woodbury process. 431
- 591 Carbutt, John, Philadelphia, Pa.—Photo-lithographic reproductions of line engravings and mechanical drawings. 432
- 592 Richards, P. D., Cambridge, Mass.—Industrial drawing. 440
- 593 Hobbs.
a Design of the Capitol of Illinois. 441
b Architectural Design. 441
- 594 Petit, Henry & Wilson, J. M., Philadelphia, Pa.—Adopted design for Machinery Hall, International Exhibition (architectural). 441
- 595 Petit, Henry, Philadelphia, Pa.—Adopted design for Main Exhibition Building (architectural). 441
- 596 Schwartzmann & Kasha, Philadelphia, Pa.—Adopted plans and designs of Memorial Hall, Judges' Hall, Horticultural Hall, and various other buildings. 441
- 597 Pope, Alexander, jr., Boston, Mass.—An English Pheasant. 452
- 598 Griot, A., Paterson, N. J.—Portraits of George Washington and Grant, worked with human hair. 454

Art Applied.

- 599 Carson, Mrs. Caroline, Rome, Italy.
a Screen. 454
b Banner flowers on silk. 454

Art Applied.

- 1 Doty Bros., Elkhart, Indiana.—Child's monument (vermont marble). 400
 2 Hoffman, F., & Sons, Sheboygan, Wis.—Animals, birds, fruits, flowers (centre table). 400
 3 Holmes, Joseph.—Plaster models. 400
 4 Spalding, Alma E., Philadelphia, Pa.
a La Nuit (French bronze). 400
b Tourist (bronze). 400
c Bacchus and Ariadne. 400
d American Cattle (bronze). 400
e Monkey and Bell (bronze). 400
f Ajax (bronze). 400
g Cream and Sugar. 400
h Chinese vases. 454
 5 Seelig, M. J., & Co., Williamsburg, N. Y.
a Venus of Milo (spelter statue). 400
b Achilles (spelter statue). 400
c Esculape (spelter statue). 400
d Mercury (spelter statue). 400
e Nymph (spelter statue). 400
f Hydria (spelter statue). 400
 6 Spalding, Hugh M., Philadelphia, Pa.
a Mercury (bronze). 400
b Besieged (dog group, bronze). 400
c Hound and Glove (bronze). 400
d Meditation, Reynard (bronze). 400
e Beethoven (bronze). 400
f Con Amore, Maid (bronze). 400
g Card Receiver (bronze). 400
h Hound, Passant (brass). 400
 7 Fick, Frederick, Philadelphia, Pa.—Monumental tablet. 401
 8 Haas, A., New York, N. Y.—Electrotype re-productions. 401
 9 Libarty, J. C. Z., Newark, N. J.—A metallic picture—Relievo of the Death of Warren at Bunker Hill. 401
 10 Lockwood, W. H., Hartford, Conn.—Electrotype plates and cuts. 401
 11 Barber, William, Philadelphia, Pa.—Medals. 402
 12 Fry's Engraving Office, Philadelphia, Pa.—Engraved brass dies. 403
 13 Baumgarten, Julius, Philadelphia, Pa.—Seal presses, die models, drawings and designs. 404
 14 Kendall, T. A., Reading, Pa.—Collection of U. S. State seals. 404
 15 Lebrethon, Jules, New York, N. Y.—Cameos and medallions. 404
 16 Mitchell, Henry, Boston, Mass.—Specimens of stone gems and impressions of seals, etc. 404
 17 Patterson, Joseph S., Philadelphia, Pa.—Intaglio. 404
 18 Rowe, G. A., Philadelphia, Pa.—
a Lathe engraving on precious stones. 404
b Frames of seals, etc. 404
 19 Giddings, Thomas, Williamsport, Pa.—Picture frame (hand work). 405
 20 Holmes, Jos.—Wood carvings. 405
 21 Knox, George W., Cleveland, Ohio.—Bunker Hill Monument, etc. (specimen of whittling). 405
 22 Lindner, Richard, New York, N. Y.—Marriage of Emperor Maximilian with Maria of Burgundy, after Canova (wood carving). 405
 23 Meyer, Conrad, Cleveland, Ohio.—William Tell and Gesler (specimen of carving in wood). 405
 24 Pope, Alex., jr., Boston, Mass.—Wood-carving. 405
 25 Priestman, James, Boston, Mass.—Wood-carvings and ornamental stucco. 405
 26 Stehlin, Joseph, New York, N. Y.
a Fragment of an Altar (bas-relief in wood, very old). 405
b Henry IV. at Canosa (bas-relief in wood, very old). 405
c The Last Supper (bas-relief in wood, very old). 405
d Birth of Christ (bas-relief in wood, very old). 405
e Death of Mary (bas-relief in wood, very old). 405
 27 Snowdon, Thos. W., Philadelphia, Pa.—Christian Schlagel (group of wood sculpture). 405
 28 Weiss, Noah, Philadelphia, Pa.—Carving in wood done with a pocket-knife. 405
 29 Benson, Eugene.—Picture of Interior of St. Mark's Church, Venice. 410
 30 Fitzpatrick, Arthur, & Co.—Oil painting. 410
 31 MacGrath, T. J. Hyland, New York, N. Y.—Coats of arms, crests, etc. 410
 32 Rice, G. S., New Haven, Conn.—Specimens of heraldry, crests, etc. 410
 33 Schillberg & Coleman, Germania, Ala.—Picture. 410
 34 Volkmar, Chas., sr., Baltimore, Md.
a Lining and restoring oil paintings. 410
b Specimens of new process of painting with oil. 410
 35 Volkmar, Chas., jr., Baltimore, Md.—Oil painting. 410
 36 Condit, Israel D., jr., Milburn, N. J.—Illumination in water color. 411
 37 Manners, Miss A. F., New York, N. Y.—Monograms and miniature painting. 411
 38 Rogers, Thomas Mellon, Philadelphia, Pa.—American locomotive (water color). 411
 39 American Enamel Decorating Co., New Haven, Conn.—Decoration of pottery and porcelain. 413
 40 Bevington, S., Philadelphia, Pa.—Painted porcelain. 413
 41 Gray, George, Philadelphia, Pa.—Decorated china, glass, etc. 413
 42 Hirrlinger, C. W., New York, N. Y.—Enamels and enamel paintings. 413
 43 Steele Brothers, Philadelphia, Pa.—Decorated china and engraved glass. 413
 44 Salt, James, Philadelphia, Pa.—Flowers painted on glass. 413
 45 Sulzbacher, Louis, Alleghany City, Pa.—Process of decorating vases, glass, china, etc. 413

Art Applied.

- 46 Walter, Theodore, Boston, Mass.—Decorated china. 413
- 47 Walter, Theodore, Boston, Mass.—Decorated china-ware. 413
- 48 Baumgarten, Julius, Philadelphia, Pa.—Seals, presses, dies, models, etc. Drawings, etc. 420 & 421
- 49 Becker, Geo. J., Philadelphia, Pa.—Drawings by pupils of Girard College. 420
- 50 Bensell, E. B., Philadelphia, Pa.—Drawings on wood. 420
- 51 Cohen, T. T., Philadelphia, Pa.—Overthrow of Jupiter (crayon drawing). 420
- 52 Cox, W. B., Brooklyn, N. Y.—Crayon portrait. 420
- 53 Cooper Union School, New York, N. Y.—Drawings. 420
- 54 Carpenter, D. H., Collinsville, Conn.—Daniel in the Den of Lions, Cartoon. 420
- 55 Cooper Union Woman's Art School, New York, N. Y.—Drawings. 420
- 56 Darley, F. O. C., Claymont, Del.
a Puritans barricading their house against Indians. 420
b A Merciful Man is Merciful to his Beast (drawings in black and white). 420
- 57 Ellis, S. A., New York, N. Y.—Crayon portrait. 420
- 58 Fletcher, Thomas S., Delanco, N. J.—Portrait of a Child (pencil drawing). 420
- 59 Fenety, Andrew C., Newark, N. J.—Portrait in crayon. 420
- 60 Frick, Frederick, New York, N. Y.—Crayon picture. 420
- 61 Girardi, Felice, New York, N. Y.—America, Liberty, Justice, etc. (pen drawing). 420
- 62 Hendrickson, Samuel, Brooklyn, N. Y.
a Crucifixion of Christ. 420
b Washington crossing the Delaware (crayon drawings). 420
- 63 Jordan, Andrew W., New York, N. Y.—Pastel crayon and India ink portraits. 420
- 64 Koevorts, Cornelius G., New York, N. Y.—Crayon drawings. 420
- 65 Keyser, J. G., Bridgeton, N. J.—Portrait in crayon. 420
- 66 Murphy, Miss Eliza, Detroit, Mich.—Monochromatic drawings (landscapes). 420
- 67 Metzner, Henry, New York, N. Y.—Drawings by the pupils of the free school of the New York Turnverein. 420
- 68 Pertz, Anne Julia, Berlin, Prussia.
a Mrs. Nicholas Fish (crayon portrait). 420
b Miss Lillie Fish (crayon portrait). 420
c Italy (crayon head). 420
d Germany (crayon head). 420
- 69 Rawson, R. F., Worcester, Mass.—Ink paintings. 420
- 70 Reich, J., Philadelphia, Pa.—Life size portraits (crayon). 420
- 71 School of Design, Cincinnati, Ohio.—Work by Students of the School of Design. 420
- 72 Sanders, Woodford, Bristol.
a Ink Portrait of A. G. Thurman, Senator from Ohio. 420
b Christ's coming Kingdom and Final Judgment (pen picture). 420
- 73 Sanborn, Jos. A., Madison, Wis.—Pen picture. 420
- 74 Steinhaus, W., New York, N. Y.—Pen and ink drawings. 420
- 75 Schell, Fred. B., Philadelphia, Pa.—Landscape drawing. 420
- 76 Tobias, W. Roth., Cleveland, Ohio.—Crayon portrait from life. 420
- 77 Whiteman, Mary Hettie, Philadelphia, Pa.
a S. G. Ruggles, Chief of Police (crayon portrait). 420
b Grand Duke Alexis (crayon portrait). 420
- 78 Wilson, Miss Lennie R., Philadelphia, Pa.—Romulus (crayon). 420
- 79 Winner, W. E., Philadelphia, Pa.—Figure subjects (crayon). 420
- 80 Wiles, L. M., Ingham University, Le Roy, N. Y.—Staunton, P. P., Paintings and Crayons. 420
- 81 American Bank Note Company, New York, N. Y.—Specimens of bank note engraving. 421
- 82 Brett, W. H., & Co., Boston, Mass.—Steel engravings and cards. 421
- 83 Bien, Julius, New York, N. Y.—Maps, illustrations and engravings. 421
- 84 Continental Bank Note Co., New York, N. Y.—Engravings. 421
- 85 Cooper Union Woman's Art School, New York, N. Y.—Engraving work by scholars. 421
- 86 Dréka, Louis, Philadelphia, Pa.—Specimens of steel and copper plate engravings. 421
- 87 Forbes, Edwin, Brooklyn, N. Y.—Reminiscences of the Great Army (copper plate etchings). 421
- 88 Homer, Lee, & Co., New York, N. Y.—Specimens of steel and copper plate engraving. 421
- 89 Hollyer, Samuel, Guttenburg, N. J.—Engravings. 421
- 90 Kimmey, John D., New York, N. Y.—Solomon's Temple (engraving). 421
- 91 Lowell, J. A., & Co., Boston, Mass.—Specimen steel plate engravings, etc. 421
- 92 McLees, A., New York, N. Y.—Specimens of lettering and letter engraving. 421
- 93 Meyer, James, jr., New York, N. Y.—Engraving. 421
- 94 Moore, R. E., New York, N. Y.
a Evening, the Pet Lamb (engraving). 421
b New Hampshire Scenery. 421
- 95 McRae, John C., New York, N. Y.
a First in Peace (engraving). 421
b Raising Liberty Pole, 1776 (engraving). 421
c The Day we Celebrate, 1876 (engraving). 421
- 96 Nichols, H. H., Washington, D. C.
a Frame of surgical engravings. 421
b Frame of zoological engravings. 421
- 97 National Bank Note Co., New York, N. Y.—Specimens of steel plate bank note engravings. 421
- 98 Overbaugh, A. W., New York, N. Y.
a Engraved crests, monograms, etc. 421
b Engraving on coins. 421
- 99 Patten, George D., jr., Philadelphia, Pa.—Engraving of Lincoln. 421

Art Applied.

- 100 Perine, Geo. E., New York, N. Y.—Engravings. 421
- 101 Pease, Joseph Ives, Canaan, Conn.
a Specimens of bank note engraving. 421
b Old '76 and Young '86 (engraving). 421
- 102 Photo-engraving Co., New York, N. Y.—Engravings from relief plates produced by the "Moss process," specimens of the Plates. 421
- 103 Sartain, Samuel, Philadelphia, Pa.
a Clear the Track, from C. Schussele (engraving). 421
b The Song of the Angels, from T. Moran (engraving). 421
c One of the Chosen, from Guy (engraving). 421
d Portraits (engraving). 421
e Evangeline, after Faed (engraving). 421
- 104 Volkmar, Chas., jr., Baltimore, Md.—Etching on copper. 421
- 105 Whitechurch, Percy, Philadelphia, Pa.—Capture of the "Serapis" by the "Bon Homme Richard;" India proof of a steel engraving, after the painting by James Hamilton, Esq. 421
- 106 Bolden, Robert H., New York, N. Y.—A Golden Sermon replete with Living Texts, published 4th of July, 1776 (wood letter engraving). 422
- 107 Crosscup & West, Philadelphia, Pa.—Wood engravings. 422
- 108 Cohn, Louis H., & Co. New York, N. Y.—Natural wood prints. 422
- 109 Ehlers, J. D., & Co., Baltimore, Md.—Electrotypes and proofs. 422
- 110 Harley, J. S., New York, N. Y.—Wood engraving. 422
- 111 Hamner, G. D., New York, N. Y.—Specimen wood engravings. 422
- 112 Johnson & Dyer, Boston, Mass.—Wood engravings. 422
- 113 Lockwood & Randolph, New York, N. Y.—Compressed wood, a substitute for box wood for engraving purposes. 422
- 114 Lauderbach, Jas. W., Philadelphia, Pa.
a Wood engravings. 422
b Illustrated books. 422
- 115 Muller, R. A., Brooklyn, N. Y.—Engraving on wood. 422
- 116 Mayer, Charles, Jersey City, N. J.—Engraving on wood. 422
- 117 Redman & Kenney, New York, N. Y.—Engraving on wood. 422
- 118 Smart, F. L. & R. M., New York, N. Y.—Engraving on wood. 422
- 119 Thompson, J. C., Providence, R. I.—Wood engraving. 422
- 120 Bressler & Kressler, Philadelphia, Pa.—Specimens of lithography in frames. 423
- 121 Camp, J. H., Philadelphia, Pa.
a Lithographic and photo-lithographic printings. 423
b Reproduction of engravings. 423
- 122 Gibson, John, New York, N. Y.—Lithographic work. 423
- 123 Keyser, J. G., Bridgeton, N. J.
a Colored lithographs. 423
b Campaign sketches of 24th Reg't N. J. Vols. 423
- 124 Leonhardt, Theo., & Son, Philadelphia, Pa.—Specimens of lithographic work. 423
- 125 Longacre & Co., Philadelphia, Pa.
a Specimen of wood engravings. 423
b Specimen of engraving on stone. 423
c Lithographic printing. 423
d Automatic engine. 423
- 126 Meyer, Ferd., New York, N. Y.—Lithographs. 423
- 127 Potsdamer & Co., Philadelphia, Pa.—Commercial lithographs, engravings, etc. 423
- 128 Rice & Co., St. Paul Lithographic Co., St. Paul, Minn.—Lithographs, maps, etc. 423
- 129 Bateman, Horatio, New York, N. Y.—Lithographic engraving of "Reconstruction." 423
- 130 Graf Bro., Philadelphia, Pa.—Lithographic printing and engraving in colors. 423
- 131 Leggo Bros., New York, N. Y.
a Specimens photo-lithographic. 423
b Specimens photo-engravings. 423
- 132 Muntz Bros. & Co., Boston, Mass.—Assortment of iron lithograph prints. 423
- 133 McLellan, D. M., Boston, Mass.—Lithographic work. 423
- 134 Schauer, George W., Baltimore, Md.—Colored lithographs and key-plates. 423
- 135 Vandusen, Robt., Weedsport, N. Y.
a Cattle group (lithograph from life). 423
b Horse group (lithograph from life). 423
c Trotting Horse (lithograph from life). 423
d Single Horse (lithograph from life). 423
e Sheep group (lithograph from life). 423
- 136 Centennial Chromo Co., Wm. H., Kelly, Philadelphia, Pa.—Chromos. 424
- 137 Crosbey, C. H., & Co., Boston, Mass.—Chromos. 424
- 138 Demorest, W. Jennings, New York, N. Y.—Chromo-lithographs. 424
- 139 Foerster, Edward, New York, N. Y.—Chromos. 424
- 140 Graff Bros., Philadelphia, Pa.—Lithographic press and table for printing chromos. 424
- 141 Hunter, Thos., Philadelphia, Pa.—Chromos and lithographic work. 424
- 142 Hoover, Jos., Philadelphia, Pa.—Chromos and oil paintings framed. 424
- 143 Prang, L., & Co., Boston, Mass.—Chromos. 424
- 144 Wittemann & Bros., New York, N. Y.—Centennial memorial, by M. Uffers (chromo-lithograph). 424
- 145 Cooper Union Woman's Art School, New York, N. Y.—Photographs. 430
- 146 Fitzgibbon, John H., St. Louis, Mo.—Daguerreotypes. 430
- 147 Jordon, A. W.—Plain Photographs. 430
- 148 Restein, E. P. & L., Philadelphia, Pa.—Chromos and lithographic prints. 432
- 149 Collins, M. G., Huntingdon, Pa.—Two gold and silver devices for perfuming buildings. 440
- 150 Dwyer, Edward J., Philadelphia, Pa.—Inlaid pearl on glass picture (design). 440
- 151 Held, Charles, New York, N. Y.—Engraving and designs on gold. 440

Architectural Designs and Decorations.

- 152 Heath & McKendrick, Philadelphia, Pa.
a Plaster-Paris ornamental work. 440
b Scagliola marble pedestals, etc. 440
- 153 Holin, G. R., Poughkeepsie, N. Y.
 —Specimens of designs. 440
- 154 Kaehler, George, New York, N. Y.
 —The Four Seasons. 440
- 155 Loebnitz, Charles, New York, N. Y.—Jewelry designs. 440
- 156 Roos, Peter, Boston, Mass.—Drawings and designs. 440
- 157 Benton, J. Dean, Philadelphia, Pa.
 —Metal model of the State House. 441
- 158 Bary, Pahl & Cafrade, Philadelphia, Pa.
a Design for Exhibition Building. 441
b Model of roof construction. 441
- 159 Boston Society of Architects, Boston, Mass.—Architectural drawings. 441
- 160 Croff & Camp, Saratoga Springs, N. Y.—Architectural perspectives in color. 441
- 161 Commissioners Illinois State Penitentiary, Joliet, Ill., Southworth, John, Secretary.—Drawings of the Illinois State Penitentiary. 441
- 162 Croft, G. B., Saratoga Springs, N. Y.—Architectural drawings. 441
- 163 Fairfax, I. S., Wheeling, W. Va.—Architectural designs. 441
- 164 Hartwell, H. E., Boston, Mass.—Architectural drawings. 441
- 165 Hess, Julius, Detroit, Mich.
a Perspective of Michigan State Centennial Building. 441
b Private residence of J. Hess. 441
- 166 Hobbs, Isaac H., & Son, Philadelphia, Pa.
a Suburban residences. 441
b Ravensburg Seminary. 441
- 167 Hunt, R. H., President, New York Chapter A. I. A., New York, N. Y.—Architectural designs of the New York Chapter of the American Institute of Architects. 441
- 168 Levy, Thomas S., Philadelphia, Pa.—Architectural designs. 441
- 169 Moeller, F. G., Nannet, Rockland Co., N. Y.—Plan for country-seat. 441
- 170 New England Granite Works, Hartford, Conn.
a The American Soldier. 400 & 441
b Five monuments with statues. 441
c Specimens of artistic monumental work. 441
- 171 Pettit, Henry, Philadelphia, Pa.—The design adopted by the U. S. Centennial Commission and Centennial Board of Finance for the Machinery Hall for the International Exhibition, 1876. 441
- 172 Pettit, Henry, Philadelphia, Pa.—The design adopted by the U. S. Centennial Commission and Centennial Board of Finance for the Main Exhibition Building for the International Exhibition, 1876. 441
- 173 State of Michigan.
a Architectural designs, E. E. Meyers. 441
b Architectural designs, Martin L. Smith. 441
- 174 Schulze, Paul, New York, N. Y.
a Frame of architectural drawing. 441
b Model of a building. 441
- 175 Schulze & Steinmetz, New York, N. Y.—Architectural design. 441
- 176 West & Anderson, New York, N. Y.—Architectural elevations and plans of public and private buildings. 441
- 177 Bedean, Paul, Springfield, Ill.—Designs for decoration of buildings. 442
- 178 Beeler, John C., New York, N. Y.
a Writing and painting on glass. 442
b Ceiling decoration. 441
- 179 Beckwith, Arthur, New York, N. Y.—Designs, paintings on tiles. 442
- 180 French, W. H., Philadelphia, Pa.—Models of plaster ornaments for interior decoration. 442
- 181 Finn, J. C., & Co., Philadelphia, Pa.—Paper hangings. 442
- 182 Hazzard, R. T., Philadelphia, Pa.—Panelling and decoration for ceilings and walls in original fresco ornamentation. 442
- 183 Hopson, Wm., Everett, Mass.—
a Specimens of grained wood and marble. 442
b Grained tables. 441
- 184 Hobbs, Robt. S., & Co., New York, N. Y.—Decorative paper hangings. 442
- 185 Judge, E. S., & Co., Philadelphia, Pa.—Carton-pierre pedestals, statues, figures, ornaments, etc., papier-mache work. 442
- 186 McGregor, Geo. S., Cleveland, Ohio.—Graining on wood. 442
- 187 Nagle, Cooke & Ewing, Philadelphia, Pa.—Decorative paper-hanging. 442
- 188 Oil Painted Wall Paper Manufacturing Co., Bethlehem, Pa.—Wall paper. 442
- 189 Perdicaris, I., Trenton, N. J.—Arabesque ornaments. 442
- 190 Piquenard, A. H., Springfield, Ill.
a Basso relievos. 442
b Architectural drawings. 441
- 191 Rumbold, G. W., New York, N. Y.—Imitation of marble. 442
- 192 Sheldon & Slasons, Rutland, Vt.—Marble pedestals. 442
- 193 Cliver & Elway, Altoona, Pa.—Mosaic picture frame. 452
- 194 Fisher, Mrs. J. F., Philadelphia, Pa.—Mosaic table. 452
- 195 Hoar, Wm., Philadelphia, Pa.—Inlaid book-case and work-boxes. 452
- 196 Hoffman, F., & Son, Sheboygan, Wis.—Mosaic table. 452
- 197 Lange & Bro., St. Louis, Mo.—Inlaid show-case. 452
- 198 McCracken, Samuel, Philadelphia, Pa.—Inlaid tables. 452
- 199 Baker, James, & Son, New York, N. Y.—Stained glass window. 453
- 200 Frederick, A., & Bro., Brooklyn, N. Y.—Stained glass windows. 453
- 201 Fitzpatrick, Arthur, & Co., Staten Island, N. Y.—Stained glass. 453
- 202 Lynch, A. K., & Co., New York, N. Y.—Stained and embossed glass. 453
- 203 Marshall, S. S., & Bro., Allegheny City, Pa.—Stained glass. 453
- 204 Mittermaier, M., Brooklyn, N. Y.—Stained glass window. 453

Miscellaneous Art Objects.

- 205 McPherson, W. J., & Co., Boston, Mass.—Stained glass windows. 453
- 206 Slack, S. & Co., Orange, N. J.—Stained glass. 453
- 207 West, Samuel, Boston, Mass.—Stained glass. 453
- 208 Batten, Downing & Co., Newark, N. J.—Figured and ornamental glass for doors and windows. 454
- 209 Bureau, Edward, Philadelphia, Pa.—Bronze card receiver, sphynx. 454
- 210 Brooks, John, Lemont, Ill.—Holy Bible in Lemont marble. 454
- 211 Ball, Jos. S., Washington, D. C.—Cross and vases; perforated paper cutter with penknife. 454
- 212 Benham, J. N., jr., Philadelphia, Pa.—The Nubian Girl burnt in wood. 454
- 213 Barlow, Joel H., Hudson City, N. J.—Drawings, lithographs, photographs, engravings, and ornamental penmanship. 454
- 214 Corkill, Edmund, York, Pa.—Imitation of marble, etc. 454
- 215 Caldwell, Solomon, Monroe, N. Y.—Battle of the Horatii and Curatii Gobel tapestry. 454
- 216 Cartisser, J., New York, N. Y.—Embossed glass. 454
- 217 Clarke, Chas. H., Milwaukee, Wis.—Ornamental presiding chair made of wood from the Washington Elm, Cambridge, Mass. 454
- 218 Cramer, Aug. S., Green Bank, N. J.—Tapestry work. 454
- 219 Dole, C. B., Cleveland, Ohio.—Declaration of Independence, pen specimen. 454
- 220 Fraser, Christian, Philadelphia, Pa.—Gilt frames, Norman design. 454
- 221 Fischer, Adolph, New York, N. Y.—Marbleized glass. 454
- 222 Freeman, Augusta.—Bronze vase. 454
- 223 Gruger, P. E., Lancaster, Pa.—Specimen letters. 454
- 224 Gardner, D. W., Brooklyn, N. Y.—Canvass stretchers. 454
- 225 Halliday, N. H., Boston, Mass.—Autumn-leaf panels. 454
- 226 Horning, F. L. B., New York, N. Y.—A picture of tokens, etc. 454
- 227 Kennedy, W. E., Tarentum, Pa.—Game, squirrel and two partridges on pine board. 454
- 228 Kinder, Edward, Philadelphia, Pa.—Two pictures worked with zephyr wool—Little Girl, John Anderson, my Joe. 454
- 229 Kelly, Wm. J., New York, N. Y.—Specimens of typographic art. 454
- 230 Kappeler, Tobias, New Haven, Conn.
a Imitation of fossils. 454
b Imitation of India rubber. 454
c Imitation of wood, ivory, terra cotta, etc. 454
- 231 Kirkpatrick, C. & W., Anna, Ill.
a Stone jar with Declaration of Independence. 454
b Snake jug. 454
c Iron ore. 454
d Porcelain clay and plastic fire-clay. 454
e Clay model of stone image. 454
- 232 Kreutzberg, Chas., Philadelphia, Pa.—Model in wax. 454
- 233 Kraft, Frank, St. Louis, Mo.—Illuminated copy of the Declaration of Independence. 454
- 234 Levi, Henry, New York, N. Y.—Penmanship. 454
- 235 Macy, R. H., & Co., New York, N. Y.—Glass table ware. 454
- 236 Maningstern, Peter, Newark, N. J.—Precious stones and Agate specimens. 454
- 237 Morris, Wm. V., Salt Lake City, Utah Territory.—Ornamental sign on plate glass. 454
- 238 Matthews & Warren, Buffalo, N. Y.—Illuminated Printing. 454
- 239 O'Halloran, A. G., New York, N. Y.—Worsted embroidery. 454
- 240 Sandberg, Mrs. C., New York, N. Y.—Bird of Paradise, painted on silk. 454
- 241 Spooner, Mary C., Madison, Wis.—Spatter-work pictures. 454
- 242 Smith, J. B., Jersey City, N. J.—The American Shield of Liberty. 454
- 243 Steinhaus & Frickerhaus, New York, N. Y.—Crochet and embroidery. 454
- 244 Seawell, Charles H., St. Louis, Mo.—Illuminated design. 454
- 245 Stubenbord, C., New York, N. Y.—Venus, worked on silk with human hair. 454
- 246 Schmidt, Geo., Saratoga Springs, N. Y.—Frame of pictures in black paper. 454
- 247 Sell, Edgar Emerick, Charleston, S. C.—Needle work, Henry VIII., Act III., Scene I. 454
- 248 Stroefor & Kirchner, New York, N. Y.
a Paintings, drawings, cartoons, steel plates, etc. 454
b Photographs. 454
c Fine art books. 454
- 249 Stoll, J. A., Williamsburg, N. Y.
a Columbia (relievo painted). 454
b Germania (relievo painted). 454
c Goddess of Fruit (relievo painted). 454
d Goddess of Wine (relievo painted). 454
- 250 The Decorative Wood Co., Rahway, N. J.—Signs in imitation of embossed leather. 454
- 251 Wieseahn, F. W. H., St. Louis, Mo.—Penmanship, pen drawing, lettering, etc. 454
- 252 Whiton, H., & Co., Philadelphia, Pa.—Artistic sign painting. 454

CANADA.

Sculpture, Paintings, Photographs.

- 1 Forsyth, Robert, Montreal.—Granite Monument. 400
- 2 Luppen, F. Van, Montreal.—Busts. 400
- 3 Owen, J. G., Toronto.—Illuminated engravings. 403
- 4 Smith, R. & Co., Toronto.—Embossing. 403
- 5 Woodward, Grant & Co., Toronto.—Embossing, relief, gold and silver. 403
- 6 Smith, R. & Co., Toronto.—Die sinking. 404
- 7 Woodward, Grant & Co., Toronto.—Embossing cameo. 404
- 8 Bennett, Geo., London.—Carved wood. 405
- 9 Côté, J. B., Quebec.—Ship's figure head. 405
- 10 Villeneuve, T., New Liverpool.—Paintings Church altar and statue. 405
- 11 Harrison, Miss S. W., Quebec.—Oil paintings. 410
- 12 Merritt, J. P., St. Catherine's.—Battle of Queenstown. 410
- 13 Notman, W., Montreal.
a Portraits. 410
b Landscapes. 410
- 14 Robinson, H. S., Kingston.—Banners. 410
- 15 Sewell, E. W., Lévis.—Oil paintings. 410
- 16 Stephenson, Miss J., St. John.—Baru and hair pictures. 410
- 17 St. Joseph Convent, Lévis.—Oil paintings. 410
- 18 Barrell, A. T., Halifax.—Oil paintings. 410
- 19 Bertrand, E.—A street in Algiers. 410
- 20 Burne, Miss M., Paradise.—Old Country Inn. 410
- 21 Convent of Good Shepherd, Quebec.—Oil paintings. 410
- 22 Day, Farshaw, Halifax.—Nova Scotia scenery. 410
- 23 Fine Arts Association, Toronto.—Oil paintings. 410
- 24 Hazen, Mrs. E. M., Fredericton.—Oil paintings. 410
- 25 Burne, Miss, Paradise.—Resting. 411
- 26 Fine Arts Association, Toronto.—Water colors. 411
- 27 Hazen, Mrs., Fredericton, N. B.—Wild flowers. 411
- 28 James, Mrs. I. A., Richibucto.—Water colors. 411
- 29 Morrison, J. C., St. John.—Water Colors. 411
- 30 Sanderson, Miss, Halifax.—Two Water color paintings. 411
- 31 Sewell, E. W., Lewis.
a Portraits. 411
b Landscape. 411
- 32 Sillery Convent, Quebec.—Water color. 411
- 33 Beckwith, A. G., Fredericton.—Pen and ink drawings. 420
- 34 Gray, F. Wood, Quebec.—Colored crayon drawing. 420
- 35 Moore, A. W., Kingston.—Canadian scenery. 420
- 36 Paull, H. G., Toronto.—Architectural drawings. 420
- 37 B. A. Bank Note Co., Montreal.—Bank-notes, bonds, engraved on steel. 421
- 38 Bishop, Geo. & Co., Montreal.—Crests, monograms, cards, etc. 420
- 39 Smith, R. & Co., Toronto.—Engravings from copper-plate. 421
- 40 Woodward, Grant & Co., Toronto.—Engravings from copper-plate. 421
- 41 Flourselling, C. H., St. John.—Wood engraving. 422
- 42 Bishop, Geo. & Co., Montreal.—Lithographs. 423
- 43 Ralph, Smith & Co., Toronto.—Lithographs. 423
- 44 Woodward, Grant & Co., Toronto.—Lithographs. 423
- 45 Smith, R. & Co., Toronto.—Lithographs. 423
- 46 Merritt, J. P., St. Catherine's.—Chromo, Battle of Queenstown. 424
- 47 Woodward, Grant & Co., Toronto.—Chromo-lithographs. 424
- 48 Anderson, W., Toronto.—Canadian scenery, photographs. 430
- 49 Burrow, R. W., Kingston.—Canadian scenery, photographs. 430
- 50 Bruce, I. & Co., Toronto.—Photographs, plain and colored. 430
- 51 Clino, I. S., St. John.—Photographs. 430
- 52 Farmer Bros., London.—Photographs. 430
- 53 Grenier, H. N., Montreal.—Photographs on wood for engraving. 430
- 54 Henderson, A., Montreal.—Landscape photographs. 430
- 55 Johnson, E. L., Goderich.—Views of Goderich, photographs. 430
- 56 Maynard.—Photographs, Indian villages, etc. 430
- 57 Maynard.—Photographs, Indian villages, etc. 430
- 58 Morton, J. D., St. John.—Photographs. 430
- 59 Middlemiss & Hunter, Toronto.—Photographs, plain and colored. 430
- 60 Notman, Wm., Montreal.—Photographs, varieties, etc. 430

Water Colors.

- 25 Burne, Miss, Paradise.—Resting. 411
- 26 Fine Arts Association, Toronto.—Water colors. 411
- 27 Hazen, Mrs., Fredericton, N. B.—Wild flowers. 411
- 28 James, Mrs. I. A., Richibucto.—Water colors. 411
- 29 Morrison, J. C., St. John.—Water Colors. 411
- 30 Sanderson, Miss, Halifax.—Two Water color paintings. 411

Water Colors.

- | | | | |
|---|-----|---|-----|
| 61 Shakspeare.—Cartes de visites of Indians. | 430 | 71 Lardham, Ottawa.—Inlaid work. | 452 |
| 62 Evans, O. C., Hamilton.—Window shades, signs, etc. | 440 | 72 Lee, W., Toronto. | |
| 63 Halon, Alphonse, Quebec.—Models of fire-places. | 440 | <i>a</i> Inlaid table. | 452 |
| 64 Grant & Holliwell, Toronto.—Architectural Designs. | 441 | <i>b</i> Inlaid table. | 452 |
| 65 Sterling & Dewar, Halifax, Nova Scotia.—Architectural Designs. | 441 | 73 Stuart, Hamilton.—Inlaid centre-table. | 452 |
| 66 Greig, A. N., Montreal.—Imitation of wood, marble, etc. | 442 | 74 White, J., Ingersoll.—Inlaid box and frame. | 452 |
| 67 Oliver, R., Toronto.—Imitation of wood, marble, etc. | 442 | 75 Wright, Jas., Montreal.—Parquettry flooring. | 452 |
| 68 Bevis, W., Hamilton.—Inlaid centre-table. | 452 | 76 Hobendan & Mildrum, Toronto.—Painting on glass. | 453 |
| 69 Bouchard, Jos., Montreal. | | 77 Convent, Sillery, Quebec.—Picture in hair. | 454 |
| <i>a</i> Chess-board. | 452 | 78 Marven, Miss E. G., St. John.—Bark picture. | 454 |
| <i>b</i> Inlaid wood. | 452 | 79 Stephenson, Miss J., St. John.—Oriental chess-table. | 454 |
| 70 Harmann, J. H. R., Hull.—Inlaid table. | 452 | 80 Walker, A., Halifax.—Designs in gold on glass. | 454 |

FRANCE.

Sculpture.

- | | | | |
|---|-----|---|-----|
| 1 Arson, Alphonse, Paris. | | 14 Durst, Marius Puteaux, Paris,—"The Laugher" (bronze bust). | 400 |
| <i>a</i> Partridge (silvered bronze group). | 400 | 15 Dubucand, Alfred, Paris. | |
| <i>b</i> Island Birds (old silver group). | 400 | <i>a</i> Sahara Hunting (bronze group). | 400 |
| 2 Bartholdi, Frederic Auguste, Paris. | | <i>b</i> Ostrich Hunting (bronze group). | 400 |
| <i>a</i> The Young Vine Grower. | 400 | 16 Doublemard, Amedée Ponatin, Paris. | |
| <i>b</i> Funeral Genius. | 400 | <i>a</i> Education of Bacchus (bronze group). | 400 |
| <i>c</i> The Enjoyment of Peace. | 400 | <i>b</i> Scapin of Molière (bronze statue). | 400 |
| <i>d</i> Genius in the Grasp of Misery. | 400 | 17 Devaux, François Alexandre, Rouen.—Louis Bouillet, deceased actor (marble bust). | 400 |
| 3 Blanchard, Jules, Paris.—A Young Equilibrist (bronze statue). | 400 | 18 Dalon, Jules, Paris.—The Needle Woman (silvered bronze statuette). | 400 |
| 4 Berteaux, Mme. Leon, Paris. | | 19 Froc, Robert & Son, Paris.—Religious statues. | 400 |
| <i>a</i> Young Girl Bathing (bronze statue). | 400 | 20 Gabineau, Joseph Arthur Comte de, Stockholm, Sweden. | |
| <i>b</i> Bust of Female (marble statue). | 400 | <i>a</i> Valkgrie after the Victory (marble bust). | 400 |
| 5 Barrias, Ernest Louis, Paris.—"The Spinning Girl of Megare" (silvered bronze statue). | 400 | <i>b</i> Queen Mab (marble bust). | 400 |
| 6 Blot, Eugene, Bologne Sur-mer.—Groups, statuetts, busts, etc. | 400 | 21 Girard, Noel Jules, Paris.—Iphigenia Sacrificed (marble statue). | 400 |
| 7 Cordier, Charles, Paris.—Priestess of Isis (enamelled bronze statue). | 400 | 22 Gautherin, Jean, Paris.—Two Good Friends (marble group). | 400 |
| 8 Chatrousse, Emile, Paris.—Heloise and Abelard's last Farewell (bronze). | 400 | 23 Itasse, Adolphe, Paris. | |
| 9 Crauk, Gustave, Paris.—Marshal MacMahon (statuette silvered bronze). | 400 | <i>a</i> The Christmas Shoe. | 400 |
| 10 Cécioni, Paris.—"Child with Chicken" (statuette). | 400 | <i>b</i> Birth of Love. | 400 |
| 11 Cambos, Jules, Paris. | | <i>c</i> Day and Night. | 400 |
| <i>a</i> The Grasshopper (bronze statue). | 400 | <i>d</i> L'amour au Pantin. | 400 |
| <i>b</i> The Erring Wife (bronze statue). | 400 | <i>e</i> John Crying and John Laughing. | 400 |
| 12 Cain, Auguste, Paris. | | <i>f</i> Marble Busts. | 400 |
| <i>a</i> Pheasant's Nest (bronze group). | 400 | <i>g</i> Rest and Sorrows of the World. | 400 |
| <i>b</i> Cock-Fighting (bronze group). | 400 | <i>h</i> Child and Dove. | 400 |
| 13 Caillé, Joseph Michel, Paris.—Bacchante playing with a Panther (bronze group). | 400 | <i>i</i> Child and Snail. | 400 |
| | | <i>k</i> Love Sleeping. | 400 |
| | | <i>l</i> Last Light. | 400 |

Sculpture, Paintings.

- 24 Loison, Pierre, Paris.—The Young Convalescent (marble group). 400
- 25 Lechesne, Aug. Jean Bap., Paris.—Parrots (bronze groups). 400
- 26 Lanson, Ernest, Paris.—Bianca (marble bust). 400
- 27 Moulin, Hippolyte, Paris.
a A Discovery at Pompeii (bronze statue). 400
b A Secret from Above (bronze group). 400
- 28 Moreau, Vauthier Augustin, Paris.—Young Walien Shepherd (bronze). 400
- 29 Mégret, Louis Nicolas Adolphe, Paris.—David's Child (bronze statue). 400
- 30 Méne, Pierre Jules, Paris.
a Valet and his Couple (bronze group). 400
b Hunting in Scotland (bronze group). 400
c Falconer on Horseback (bronze group). 400
- 31 Martin, Felix, Paris.
a Louis XI. at Peronne (bronze statue). 400
b Negro Hunting (bronze group). 400
- 32 Marcellin, Jean Espret, Paris.—Cypris Nursing Love (bronze). 400
- 33 Pautrot, Jules, Paris.—Falcons' Fight (bronze group). 400
- 34 Perrey, Napoleon, Aimé Paris.—Young Goatherd playing with a Squirrel (marble group). 400
- 35 Ringel, E. P. T. Désiré, Paris.—A Florist (silvered bronze statuette). 400
- 36 Roubaud, Louis Auguste, Paris.
a Winter (bronze statue). 400
b Young Maid (marble bust). 400
c Child (marble bust). 400
- 37 Ross, Alfred, Paris.—Bohemians at the Spring (bronze statue). 400
- 38 Raffl & Co., Paris.—Religious statues. 400
- 39 Schrøder, Louis, Paris.—Etruscan Art (marble statue). 400
- 40 Têlon, Joseph, Paris.
a Oceany (stone statue). 400
b Resting Hour (marble statue). 400
c Navigation (bronze bust). 400
- 41 Vasselot, Anatole Marquet de, Paris.
a Chloë (bronze statue). 400
b Portrait of Mr. Auzon (bronze statue). 400
- 42 Waagen, Paris.—Kabyle Hunting (bronze group). 400
- 43 Cordier, Charles, Paris.
a Young Greek Women. 401
b Fellah Women. 401
c Christopher Columbus. 401
- 44 Keller, Florent, Antoine, Paris.
a Family. 401
b Betrothlings. 401
c Car Race. 401
d Shooting School. 401
e The Gods of the Waves. 401
f Nautical Pleasures. 401
- 45 Le Cointe, Aimé, Joachim, Leon, Paris.
a The Adieu. 401
b Vase of Peace. 401
c Sciences, Letters, Arts, Industry and Commerce. 401
- 46 Gabineau, Joseph, Arthur, Comte de, Stockholm, Sweden.—Evening Star (marble medallion). 402
- 47 Keller, Florent, Antoine, Paris.
a The Time and the Seasons. 402
b Alsace Slave. 402
c In Memory of the American Centennial. 402
- d* To the Saviors of the United States. 402
e Hercules' Child. 402
f Neptune. 402
g Portrait. 402
h Portrait. 402
- 48 Le Cointe, Aimé, Joachim Leon, Paris.—Pericles, Auguste, Léon N., Louis XIV. 402
- 49 Cordier, Charles, Paris.—Arabian Women (onyx and bronze). 404
- 50 Fromont, H., Paris.—Engravings on crystal. 404
- 51 Martin, Georges, Paris.
a Portrait of the Empress Josephine (cameo on onyx). 404
b Portrait of Benjamin Franklin (cameo on onyx). 404
- 52 Chovet, L., Paris.—Way of the Cross and religious paintings. 410
- 53 Accard, Eugene, Paris.—The Two Sisters. 410
- 54 Allemand, Gustave, Lyons—Young Girl with Fruits. 410
- 55 Adan, Louis Emile, Paris.
a Inquisition Scene. 410
b Conspiracy under Catharine Medicis. 410
- 56 Autigna, Jean Pierre Alex'dre, Paris.
a First Step in Crime. 410
b Fascination. 410
c Wreck. 410
- 57 Béliard, Edouard, Paris.
a Interior of a Studio. 410
b Banks of the Oise, snow scene. 410
- 58 Bellangé, Eugene, Paris.—Evening after the Battle (Italy). 410
- 59 Berthélemy, Pierre Emile, Paris.—Preparing to Fish. 410
- 60 Bar, Pierre Alexandre de, Paris, Autenil.
a View taken at Boulak, Egypt. 410
b Death of Virginia. 410
- 61 Bartholdi, Frédéric Auguste, Paris.
a Old California. 410
b New California. 410
- 62 Bellel, Jean Joseph, Paris.
a The Valley of Alcegar. 410
b Saw-Mill on the shores of Sillett. 410
c Neighborhood of Constantine, Algeria. 410
d Bazaar, street in Constantine. 410
- 63 Bidan, Eugene, Paris.—The Little Quarrellers. 410
- 64 Blanc, Celestin Joseph, Paris.—A Feast to the Madonna (Naples). 410
- 65 Blum, Maurice, Paris.
a A Painful Operation. 410
b A Grave Consultation. 410
- 66 Brest, Tabius, Paris.
a Court of the Grand Mosque at Trebizonde. 410
b Kief on the Road from Kerras unde to Amasia. 410
- 67 Brisaot de Warville, Felix Saturnin, Compiègne.—Ship Yard. 410
- 68 Breton, Emile, Courrières, Rasde, Calais.
a A Village of Artois in Winter. 410
b The Canal of Courrières in Autumn. 410
- 69 Brunet, Houard (Pierre Auguste), Fontainebleau.
a Interior of a Menagerie. 410
b Learned Dogs and Monkeys at the Castle. 410
c Horse Fair in the East of France. 410

Oil Paintings.

- 70 Brueille, Gaston, Paris.—Fishing-Boat Surprised by a Gale. 410
- 71 Busson, Charles, Montoire (Lois et Ches).—After the Rain. 410
- 72 Bonnefoy, Henry, Paris.—This-tles. 410
- 73 Beaucé, Jean Adolphe, Paris.—In-terior of a Sheepcote. 410
- 74 Ballavoine, Jules Frédéric, Paris.—The Bouquet. 410
- 75 Barrias, Felix Joseph, Electre, V. Hugo. 410
- 76 Bellée, Léon Le Goaesbe de, Paris.
a The Pillars of Scornée at Belle le en Mer. 410
b Inn on the Border of a Forest. 410
c Snow Scene. 410
- 77 Benouville, Achile, Paris.
a The Banks of La Nive. 410
b Souvenirs of Palestrina, Italy. 410
- 78 Ballot, Mme. Adelaide, Paris.—Meditation. 410
- 79 Becker, Georges, Paris.—Rizpah Protecting the Bodies of her Sons from the Birds of Prey. 410
- 80 Berchere, Narcisse, Paris.—After the Simoom, Gale on the Nile during the flood. 410
- 81 Baron, Stéphane, Paris.—Faust and Marguerite. 410
- 82 Cabailot, Lassalle, Paris.—Sculp-ture Exhibition of the Salon of 1874. 410
- 83 Clairval, Mrs. Marie Therese, Paris.—France in Mourning for Alsace and Lorraine. 410
- 84 Clement, Felix Auguste, Paris.
a Before the Bath. 410
b Fellah Girl. 410
c Death of Cæsar. 410
- 85 Collette, Alexandre, Paris.
a Alighting from the Railway Car. 410
b The Reader. 410
c A French Country Girl. 410
- 86 Comerre, Leon, Lille.—Cassandre. 410
- 87 Cossmann, Maurice, Paris.—An Old History. 410
- 88 Couder, Emile Gustave, Paris.—Alone at Home. 410
- 89 Courdouan, Vincent, Toulon.—Cannes, Morning Scene. 410
- 90 Cheret, Louis, Paris.—The Cours du Venéon, in the Bourg d'Oisan. 410
- 91 Chaillon, Narcisse, Lagny Lesec.
a Public Assistance in Paris. 410
b Little Watermelon Eater. 410
- 92 Castiglione, Joseph, Paris.
a Haddon Hall Castle, Derbyshire. 410
b A Call on L'Oncle Cardinal. 410
c Frascati, near Rome. 410
- 93 Castelnau, Pierre de, Paris.—Gal-leries of Apollo, Louvre. 410
- 94 Comte Pierre, Charles, Paris.
a Bohemians before the Invalid Louis XI. 410
b Sewermen Catching Rats. 410
- 95 Curzon, Paul Alfred de, Paris.
a Tryptic, History of Ruth, Morning, Har-vest, Evening, Old Testament. 410
b Serenade in the Abruzz. 410
c View taken from Fort Napoleon, Harbor of Toulon. 410
- 96 Coroenne, Henri, Paris.—Salva-tion. 410
- 97 Courdouan, Vincent, Toulon.—Moustiers St. Marie. 410
- 98 Cassinelli, Henri-Louis, Nice.—Decatur leaving the Port of Tripoli, after having set fire to the Frigate Philadelphia, in 1804. 410
- 99 Cabuzel, Aug. Hector, Paris.—A Visit to the Louvre. 410
- 100 Callias, Horace de, Paris.—A Con-cert, Period of Charles le Temeraire. 410
- 101 Carrier, Belleuse, Pierre, Paris.
a The Baptismal Plate. 410
b Sleeping Child. 410
- 102 Cetner, Alexandre, Albert de, Paris.
a Salambo. 410
b Faith. 410
- 103 Chartran, Theobald, Paris.—Roger and Angelica, Ariosto. 410
- 104 Cassagne, Armand, Paris.
a Allée de Sully, Etang des Carpes, Fon-tainebleau Palace. 410
b Through the Rocks, Morning Scene, Fon-tainebleau Forest. 410
c The Road of La Croix d'Anges, Fontain-bleau Forest. 410
- 105 Chagot, Edmond, Paris.
a The Beach of St. Briac. 410
b Wreck of a Sloop. 410
- 106 Chevrier, Jules, Place de Beaune, Saone.
a A Mouse at an Antiquary's. 410
b Gothic Hall, Rats. 410
c Rat at an Engraver's. 410
d The Captured Mice. 410
- 107 Dameron, Emile Charles, Paris.
a The Oaks of Grand Moulin, Cernay-la-ville. 410
b The Pyramids (Belle Ile en mer). 410
- 108 Duran, Carolus, Paris.—At the Sea-shore. 410
- 109 Duverger, Theophile Emmanuel, Ecouen.
a The End of the Harvest. 410
b The School. 410
- 110 De Coninck, Pierre, Paris.—Pas-torella. 410
- 111 Doux, Mad. Lucile, Paris.
a Salonique Woman. 410
b Revery. 410
- 112 Dubos, Mlle. Angele, Paris.
a The Barber's Daughter. 410
b A Big Sister. 410
- 113 Daubigny, Karl Pierre, Paris.
a The Valley of Portville, Normandy. 410
b The Oyster Shipping at Cancale. 410
c Banks of the Seine. Landscape. 410
- 114 Debat-Ponsan, Edouard, Paris.—The First Mourning, Death of Abel. 410
- 115 Douillard, Alexis-Marie, Louis, Paris.—Hope. 410
- 116 Delobbe, François Alfred, Paris.—Return from the Fields at St. Briac. 410
- 117 Dubouchet, Henri Joseph, Auteuil, Paris.—Saint Antonio, patron of the mariners of Porto d'Angio, Italy. 410
- 118 Duez, Ernest Ange, Paris.—Splendor and Misery. 410
- 119 Dupré, Leon Victor, Paris.
a Willows on the Banks of the Maine. 410
b Animals at the Watering Place. 410

Oil Paintings.

- 120 Dumaesq, Armand, Paris.
a Declaration of Independence of the U. S. of America, 4th of July, 1776. 410
b Surrender of Yorktown, the 19th of October, 1781. 410
c The Geneva Congress in 1873. 410
d Lafayette's Adieu to Washington. 410
- 121 Durst, Auguste, Puteaux.
a A Kitchen Girl. 410
b Evening Scene at Binot bridge, neighbourhood of Paris. 410
- 122 Deshayes, Ch. Felix-Edouard, Paris.
a A Meadow at Cerney-la-ville. 410
b The Return from Market, morning scene. 410
- 123 Eliot, Gabriel, Paris.
a The White Hen. 410
b Cock-fighting. 410
- 124 Fery, Miss Lucie, Paris.
a Roses and Fruits. 410
b Object of Art. 410
- 125 Faivre-Duffer, Louis Stanislas, Paris.—Venus led by Love. 410
- 126 Ferry, Jean Georges, Paris.—Worship of Bacchus. 410
- 127 Feyen, Eugène, Paris.—The Regattas of Cancale. 410
- 128 Feyen, Perrin, François, Nicolas-Augustin, Paris.
a Lesson in Anatomy by Dr. Velpeau. 410
b Melancholy. 410
c Antique Dance. 410
d Sailor's Youth. 410
- 129 Garnier, Jules-Arsène, Paris.—Bathers. 410
- 130 Glaize, Pierre Paul Leon, Paris.—Birds, the flower girl. 410
- 131 Grandchamps, Louis Emile Penel de, Paris.—Oriental Fantasia. 410
- 132 Gudin, Théodore, Chateau de la Barre (Nievre).—The Flight of a Christian Slave. 410
- 133 Gide, Theophile, Paris.
a Head-work. 410
b Stomach-work. 410
- 134 Guillon, Adolphe Trénée, Paris.
a After the Rain. 410
b First Leaves of Autumn. 410
- 135 Groiseilliez, Marcelin de, Paris.—The Moussy Valleys in Spring. 410
- 136 Herst, Auguste Clement Joseph, Paris.
a The "Saut du Doubs." 410
b Spring. 410
- 137 Hanoteau, Nector, Paris.—The Farmer's Daughter and her Chickens (snow scene). 410
- 138 Hirsch, Alphonse, Paris.
a The First-Born. 410
b The Model. 410
- 139 Hugard, Claude Sebastien, Paris.—Oak Trees on the shores of the Pond from Lumigny to Guirlande. 410
- 140 Harpignies, Henri, Paris.—Oak Trees of Chateau Renard. 410
- 141 Herpin, Leon, Paris.
a River Marne at Chermevières. 410
b Moulineau Hills. 410
- 142 Hillemacher, Eugene Ernest, Paris.
a Napoleon 1st with Goethe & Wieland. 410
b The Wedding Chest, Louis XIII. time. 410
- 143 Huas, Pierre Adolphe, Paris.
a First Coquetry. 410
b Soap Bubbles. 410
- 144 Jacquand, Claudius, Paris.—The Princess Kallimach. 410
- 145 Jacomin, Alfred Louis, Paris.
a Check-mate. 410
b The Painter. 410
c Bilboquet and his Friend. 410
- 146 Jadin, Emmanuel, Paris.—Cheikh Salié Dead in his Tent, Souvenir of the Algerian Sahara. 410
- 147 Japy, Louis Aimé, Paris.—Valley in the Jura. 410
- 148 Jobbé Duval, Felix, Paris.—Mysteries of Bacchus. 410
- 149 Jundt, Gustave, Paris.
a Selling Horses in Auvergne. 410
b The Farmer's Road. 410
- 150 Koch, Mlle. Elisa, Paris.—"You will not have any!" 410
- 151 Kienlin, Jules, Paris.
a Louis XIII. and Queen Anne of Austria. 410
b Bezique Party. 410
- 152 Kuwasseg, Carl Joseph, Paris.—View taken in Tyrol (landscape). 410
- 153 Landelle, Charles, Paris.
a Telling Women. 410
b Young Zingari. 410
c The Samaritaine. 410
- 154 Laporte, Marcellin, Paris.—The Young Bride. 410
- 155 Lebel, Edmond, Paris.
a A Transtevere Butcher, Rome. 410
b The Pont Rapide. 410
c Pastorella. 410
- 156 Lepesqueur, Hyacinthe, Paris.—The Amiable Inn Keeper. 410
- 157 Lortet, Leberecht Oullins, Rhone.—"Mont Blanc" (Haute Savoie). 410
- 158 Lays, Jean Pierre, Lyon.
a Basket of Flowers and Carved Furniture. 410
b Basket of Flowers and Grapes. 410
- 159 Laguillermie, Frederic Auguste, Paris.—The Passage du Gue. 410
- 160 Leleux, Mme. Emilie Armand, Paris.—The Doctor's Prescription. 410
- 161 Lambert, Antoine Eugene, Paris.—The Marshes of Langre (Somme). 410
- 162 Leleux, Armand, Paris.
a The First Thief, Swiss vagabonds. 410
b Chat at the Fountain. 410
c The Indiscreet, Swiss interior. 410
- 163 Legat, Leon, Paris.
a An Old Water Mill. 410
b Landscape. 410
c On the Banks of the River (landscape). 410
- 164 La Kochenoire, Charles Justien de, Paris.
a Flood of the Tourques Valley. 410
b Between Pont Leveque and Trouville (Normandy). 410
- 165 Leyendecker, Feu Mathias, Paris.—Red Partridges and Reed Birds. 410
- 166 Lacrosette, Jean Edouard, London, England.
a Royal Stables, London. 410
b Gala Horses of the Queen of England. 410
- 167 Luminant, Everiste Vitot, Paris.
a Gulls and their Family. 410
b The Morvan King. 410

Oil Paintings.

- 168 Laurent, Henri, Paris.—Interior of a Sheepcote. 410
- 169 Laporte, Emile Henri, Paris
a Vintage (decorative panel). 410
b Harvest (decorative panel). 410
- 170 Lesrel, Adolphe Alexandre, Paris.
a The Halberd Merchant. 410
b A Lord, Louis XIII. 410
- 171 Martin, Ernest, Paris.—A Surprise at the Foot of Mont Valerien. 410
- 172 Munier, Emile, Paris.—The Springs. 410
- 173 Michel, Ernest Barthelemy, Montpelier.—The Decameron. 410
- 174 Monfallet, Alphonse, Paris.
a Les Loges near St. Germain. 410
b The Equilibrist. 410
c Music in the Woods. 410
- 175 Morin, Edmond, Paris.—Flower Market of La Madeleine. 410
- 176 Moullion, Alfred, Paris.—The Bird's Paradise. 410
- 177 Muraton, Mme. Euphemie, Paris.
a At the Antiquary's. 410
b An Ouistiti Monkey. 410
- 178 Maillart, Diogene Ulysse Napoleon, Paris.
a Italian Girl with Mandolin. 410
b The Nest. 410
- 179 Monginot, Charles, Paris.—The Friends of the House. 410
- 180 Masure, Jules, Paris.—Shore of Golfe Juan in Winter. 410
- 181 Mellé, Auguste Leon, Paris.—Forest road at Antwerp-on-Oise. 410
- 182 Muraton, Alphonse, Paris.
a The Penitent. 410
b A Monk. 410
- 183 Mery, Alfred Emile, Bougival (Seine-et-Oise).—Animal's Instinct. 410
- 184 Mathieu, Oscar Pierre, Paris.
a The Nymph Echo Afflicted at the Death of Narciss. 410
b The Vanquished. 410
- 185 Masson, Mlle. Anna, Paris.
a Chrysanthemum Flowers (still life) 410
b Young Partridge. 410
- 186 Mallet, Joseph, Paris.
a The River Rhone. 410
b The Juggler's Family. 410
- 187 Maignan, Albert, Paris.
a The Favorite of the Eve. 410
b The Sylvain. 410
c Helen at the Fountain. 410
- 188 Nicolas, Mme. Marie Josephine, Paris.—The Alphabet. 410
- 189 Noterman, Zacharie, Paris.
a Dogs in the Mountair 410
b A Court of Justice. 410
c An Auction. 410
- 190 Oudinot, Achille, Paris.—Low Tide at Villerville (Calvados). 410
- 191 Perrault, Leon, Paris.
a The Bather. 410
b The Rest. 410
- 192 Protais, Paul Alexandre, Paris.—
a French Guards, Versailles, 1876. 410
b A Tide. 410
- 193 Princeteau, René, Paris.
a Horses Frightened by the Railroad. 410
b 17th of October, 1781, Washington. 410
- 194 Prion, Louis, Paris.—Young Satyr's School. 410
- 195 Plassan, Antoine Emile, Passy.—Before the Looking Glass. 410
- 196 Petit, Eugene, Paris.—Spring Bouquet. 410
- 197 Palliere, Jean Leon, Paris.—Call at the Pastor's. 410
- 198 Poncet, Jean Baptiste, Paris.
a Orphée and Eurydice returning from Hell. 410
b Mount Sully, of the Comedie Française, in the role of Oreste. 410
- 199 Pabst, Camille, Alfred, Paris.—A Bride in Alsace. 410
- 200 Renié, Jean Emile, Passy.
a Interior of the Bas Breau in the Forest of Fontainebleau, evening. 410
b Plateau of Bellecroix, the Old Oak of La Mare à Dagneau. 410
c La Calle Reale, Haranjuz, Spain. 410
d October Snow. 410
- 201 Reynaud, François, Paris.—A Market at Naples. 410
- 202 Richner, Louis Paul Ernest, Paris.—Souvenirs of L'Rainey. 410
- 203 Rivey, Arsene, Paris.
a Young Venetian Girl. 410
b Young Girl (Middle Age). 410
- 204 Rosier, Amedee, Paris.
a The Morning on the Lagune (Venice). 410
b Sunset at Sea. 410
- 205 Rudaux, Edmond Adolphe, Caudebec-les-Elbeuf.—Troubled, however (panel). 410
- 206 Rapin, Alexandre, Paris.
a Morning Dew in the Valley of onnevaux. 410
b La Mare à Morfontaine. 410
- 207 Rouffio, Paul, Paris.—"Herodiade." 410
- 208 Rougeron, Jules James, Paris.—Teasing. 410
- 209 Revel, Charles, Paris.—The Miser. 410
- 210 Sain, Edouard Alexandre, Nanterre.
a The Convalescent on Pilgrimage to the Madonna d'Angre, near Naples. 410
b Going to the Fair. 410
- 211 Salanson, Mlle. Eugenie, Paris.—Rest. 410
- 212 Sebillot, Paul, Paris.—Winter, Trees on the Seashore. 410
- 213 Selim, Mme. Honorine, Paris.—Divine Love. 410
- 214 Salles, Wagner, Mme. Adelaide, Nimes.
a The Virgin and the Child. 410
b The Little Fishermen. 410
- 215 Salles, Jules, Nimes.
a The Little Brother. 410
b Young Girl of Prociola. 410
- 216 Sebron, Hippolyte, Paris.
a Broadway in Winter. 410
b Niagara Falls. 410
c A Hebrew Wedding at Tangiers (Morocco). 410
- 217 Segé, Alexandre, Paris.
a Nantois Fountain (Britain). 410
b The Rocks at Dover. 410
- 218 Salabert, Firmin, Paris.—Armecy Lake. 410
- 219 Schenck, Auguste Frederic, Ecoen.
a Heath Flowers. 410
b Snow Flowers. 410

Oil Paintings, Enamels.

- 220 Saintin, Jules Emile, Paris.
a Leda. 410
b Solitary. 410
c The Monkey Apple. 410
d Laundress. 410
- 221 Sirouy, Achille, Paris.
a Japanese Lady. 410
b Prodigal Son. 410
- 222 Cortez, Victor, Paris.—Nymph Echo. 410
- 223 Crouillebert, Paul Désiré, Paris.
a Young Girl at the Fountain. 410
b Souvenirs. 410
- 224 Crupheme, Auguste Joseph, Paris.—A Drawing Lesson at the Cochin School. 410
- 225 Ulmann, Benjamin, Paris.—The Gitana's Dance in Grenada. 410
- 226 Valadon, Jules Emmanuel, Paris.
a The Motherly Apprenticeship. 410
b The Neighbor's Cat. 410
- 227 Veron, Alexandre René, Paris.
a A Park at Senlis. 410
b The Banks of the Seine. 410
c Boulogne sur Mer. 410
- 228 Villebesseyx, Gustave, Paris.—Stairs of the New Opera. 410
- 229 Viger, Hector Jean Louis, Paris.
a Josephine in 1814. 410
b The Mendicant. 410
- 230 Vuagnat, François, Paris.—Pasture in Normandy. 410
- 231 Villa, Emile, Paris.—The Vegetable Merchant. 410
- 232 Vély, Anatole, Paris.—The Grasshopper. 410
- 233 Willenich, Michel, Paris.
a The Ospedaletto Monastery at Venice. 410
b Naval Battle of Lissa. 410
- 234 Yvon, Adolphe, Paris.—Cæsar. 410
- 235 Yon, Edmond Charles, Paris.
a The River Seine, near Marolles. 410
b A Village near the Seine. 410
- 236 Zuber, Buhler, Paris.
a The Spring. 410
b The Morning Dew. 410
- 237 Zuber, Jean Henry, Paris.—Near the Farm, in Normandy. 410
- 238 Zier, Francis Edouard, Paris.—Julia, Sister of Lucius Cæsar. 410
- 239 Andrieux, Miss Jean Hector, Paris.—Virgin au Coussin, after Andrea Solari. 411
- 240 Bellel, Jean Joseph, Paris.—From Briskra to Jugurtha. 411
- 241 Bar, Pierre Alexandre, Paris.—Interior of a Forest (drawing fixed with wax). 411
- 242 Courdouan, Vincent, Toulon.—Girch, Egypt. 411
- 243 Cassagne, Amand Theophile, Paris.
a Birch Tree amongst Rocks, Forest of Fontainebleau. 411
b Sloping Way. 411
c Forest Outlet. 411
- 244 Chagot, Edmond, Paris.
a Views of Guernsey Island. 411
b A Street in Cairo, Caffee. 411
c An Ass-Driver in Cairo. 411
- 245 Dumas, Mme. Emma, Paris.—Flowers, Screen. 411
- 246 Felon, Joseph, Paris.
a Manner of the Innocents. 411
b The Fall of our First Parents. 411
- 247 Herst, Auguste Clement Joseph, Paris.
a The Grand. Chartreuse Fall. 411
b Aygalades near Marseilles. 411
c Pines of Provence. 411
- 248 Jacta, Miss Lucie Alexandrine, Paris.
a Centennial of American Independence, Washington, Franklin, Lafayette. 411
b Ecce Homo (enamel portrait). 411
- 249 Lestang, Larade, Leonde, Paris.—Autumn Flowers. 411
- 250 Mermet, Mme. Césarine, Paris.—Butterfly. 411
- 251 Saintin, Jules Emile, Paris.—The Motherly Breakfast. 411
- 252 Beauchard, Miss Angelina, Paris.—The Target, after Boucher. 413
- 253 Bellel, Jean Joseph, Paris.
a Gravenoire Ravine. 413
b Loneliness. 413
c Don Quixotte and Sancho Pansa. 413
- 254 Beysens et Beckers, Paris.—Church stained glass. 413
- 255 Bernard, Mrs. D., Paris.—The Bather, after Chaplin. 413
- 256 Crosson, Miss Esther, Paris.
a The Players, after Teniers. 413
b Herodiade, after Le Guide. 413
- 257 Courtoisnon, Mlle. Berthe, Paris.—The Bass Lesson, after Netscher. 413
- 258 Courdouan, Vincent, Toulon.—Dardennes Valley (fusain). 413
- 259 Chabin, Paris.—Stained window-glass. 413
- 260 Crosson, Miss E., Paris.
a Marie Antoinette. 413
b Duchesse de Lamballe. 413
c Madam Elizabeth. 413
- 261 Duplain, Mrs. A., Paris.—Cupid, after Mrs. Kauffmann. 413
- 262 Epinette, Mlle. Marie, Paris.—The Broken Pitcher, after Creuze. 413
- 263 Epinette, Mrs. M., Paris.—The Broken Pitcher. 413
- 264 Gaudez, Mlle. Cecile Delphine, Paris.—Fragment of the Painting of Venus, at Vulcain's, after Boucher. 413
- 265 Guillois, Mme. Camille, Paris.—The Grasshopper, after Voillemote. 413
- 266 Hildebrand, Miss Claire, Paris.—Helene and Paris reconciled to Venus, after Prudhon. 413
- 267 Lalanne, Maxime, Paris.
a Bordeaux (fusain). 413
b Me. de Balze's Park (fusain). 413
c View of Fribourg, Switzerland (fusain). 413
d Park of the Marquis of Meryugny. 413
- 268 Lami, de Nozan, Claude Ernest, Paris.
a François 1st. 413
b Henry 11. 413
- 269 Lorin, A., Chartres.—Two stained glass stands. 413
- 270 Mansuy, Dotin T., Paris.—Artistic enamels. 413
- 271 Maussion, Miss, Paris.—The voyage to Cythera, after Watteau. 413

Enamels, Tapestries, Engravings.

272 Maussion, Miss Elise de, Paris.

- a* The Trial of Paris. 413
- b* Suzanna Bathing. 413
- c* Moses on the Nile. 413
- d* Diana Resting. 413
- e* The Flute Lesson. 413
- f* Blind Man's Buff. 413

273 Menon, Miss M. Levallois, Perret.

- a* The Vision of Ezekiel, after Raphael. 413
- b* The delivery of Saint Peter, after Raphael. 413
- c* Flowers. 413
- d* Embroidered Curtain. 413
- e* Lamp Shade printed. 413

274 Mary, Mrs. M., Paris.—Fortune and the Child, after Baudry. 413**275 Nold, Miss Hélène, Versailles.—Porcelains.** 413**276 National Porcelain, Manufacture of Sèvres.**

- a* Two vases, Paris. The Painters and Sculpturers. Painted by Eugene Froment. 413
- b* Two vases, Paris (Pate tendre). Composed and painted by Goddé. 413
- c* Vase Alexandre Brougniart. Genius of Art and Science. Composed and painted by M. Barriat, gilded by M. Rejoux. 413
- d* Two vases Oeuf. Flowers and ornaments painted and gilt by Francois Richard. 413
- e* Vase Potiche de Macao (Peyre shape). Painting and flowers by Mr. Barré. 413
- f* A flower vase, Alexandre Brougniart. Light and Dark. Painting by Goupil from the drawing of Froment. 413
- g* Vase, Potiche. Flowers, yellow ground, by Caban. Gilt by Dericheweiter. 413
- h* A vase, oval shape, Renard. Lapis, blue ground, mounted on bronze, after the models of Mr. Briffaut. Composition of Emile Renard. 413
- i* Two vases, de la Vendange. Demi-grand, feu ground, The Seasons. Composed and painted by Brunel, gilt by Blanchard. 413
- k* Vase, Salamine. Decorations composed by E. Renard, flowers executed by M. Bulot, birds and ornaments by Gely, gilding by Bonnuait. 413
- l* Vase, Rimini. Composed by M. Avisse, executed by M. David. 413
- m* Vase of Himes. Raisins et Glyeines. Composed and painted by M. Bulot, gilded by M. Rejoux. 413
- n* Two vases, Bertin. Brown red ground, ornaments and per-venche flowers by M. Caban. 413
- o* Salamine vase. Turquoise ground, composed and executed by M. Lambert, gilt by Charpen- tier. 413
- p* Two vases Cornets. Turquoise blue grounds, flowers and birds, composed and executed by M. Bulot, gilt by M. Halliot. 413
- q* Starting for Cythere. Interpretation of Watteau. Painted on porcelain by M. Abel Schilt. 413

277 Ollendon, Me., Paris.

- a* The Beggar, after Murillo. 413
- b* The Virgin Child. 413
- c* Virgin and Child. 413

278 Ollendon, Mrs., Paris.

- a* Diana leaving the Bath, after Boucher. 413
- b* Nymphs Dancing. 413
- c* The Maidens Kiss, after Lahire. 413

279 Potin, Miss E., Auteuil.—The Italian Actor. 413**280 Pottier, Paris.—Artistic enamels, Limousin and Henry II. styles.** 413**281 Ravenez, Miss Alice, Paris.—The Jewels, after Chapelin.** 413**282 Tapestries, National Manufacture of Beauvais.**

- a* Feuille de Paravent—style Louis XIV. Vase with pinks, by Chabal Dussurgey. Artists, M.M. Mahul, Cautrel. 413
- b* Feuille de Paravent—style Louis XIV. Vase with chrysanthemes, by Chabal Dussurgey. Artists, M.M. Fontaine, Ducastel. 413
- c* Feuille de Paravent—style Louis XIV. Blue bottle with roses and grapes, by Chabal Dussurgey. Artists, M.M. Lefevre and Levegue. 413
- d* Feuille de Paravent—style Louis XIV. Blue bottle with cherries, by Chabal Dussurgey. Artists, Levegue, Cautrel. 413

283 Tapestries, National Manufacture of the Gobelines.

- a* Penelop, painting of Maillart. Artists, François Guliche, Cochery. The border by Jacquelin and Besson. 413
- b* "Amynthe and Sylvie," painting after Boucher. Artists, Louis Prudhomme, Ernest Flament, Gilbert Marie, Emile Flament. 413
- c* Fishing, after François Boucher. Artists, Emile Flament, Louis Prudhomme, Cochery, Ernest Flament. 413
- d* Banquette, yellow ground, painting of Mr. Godefroy. Artists, Carmont, Lepine. 413
- e* Banquette, blue ground, painting of Mr. Godefroy. Artists, M.M. Carmont and Brulefert. 413

284 Teka, Mrs. E., Paris.

- a* To he who Love, after Antigna. 413
- b* Adrienne Leconvreur, after Coypel. 413

285 Ballue, Paris.—Drawings. 420**286 Felon, Joseph, Paris.—Notre Dame of St. Esperance.** 420**287 Adeline, Jules, Rouen.**

- a* Cathedral of Rouen (aqua fortis). 421
- b* The Big Clock at Rouen (aqua fortis). 421

288 Brunet, Debaines, Alfred, Paris.

- a* Church of La Madonna della Salute, Venice. 421
- b* The Remains of St. Charles' Bridge. 421
- c* Hotel Dieu of Paris. 421
- d* Six etchings, after Ruysdael. 421
- e* Three etchings, after Turner. 421

289 Buhot, Felix Nifaire, Paris.—Aqua fortis, Japanese objects of art, bronzes, ivory, porcelain, and carved wood. 421**290 Ballue, Paris.—Designs.** 421**291 Coindre, Gaston Jean, Besancon.**

- a* Etchings. 421
- b* Etchings. 421

292 Dubouchet, H. J., Paris.—Engravings. 421**293 Delauney, Alf. Alexandre, Paris.—Notre Dame of Paris (etching).** 421**294 Deblois, Charles Alphonse, Paris.—The Brides.** 421

Engravings, Lithographs.

- 295 Erhard, Paris.—Geographic maps and engravings. 421
- 296 Flameng, Leopold, Paris.—Engravings. 421
- 297 Gaucherel, Leon, Paris.—Engravings. 421
- 298 Gaillard, Claude F., Paris.—Portrait of Pius IX, etc. 421
- 299 Gazette des Beaux Arts, Paris.—Engravings. 421
- 300 Goupil & Co., Paris.—Engravings. 421
- 301 Jacquemart, Jules Ferdinand, Paris.
a Frame of etchings, after Vander Helot, Carl de Moor, Trans Haal, De Vrier, and Antonio Moro. 421
b Frame of etchings, objects of art from different collections. 421
- 302 Lalanne, Maxime Paris.
a Etchings. 421
b Etchings. 421
- 303 Lamotte, Alphonse, Paris.—The One Year Volunteer. 421
- 304 Laguillerimie, Frederic Auguste, Paris.—The Surrender of Breda. 421
- 305 Levy, Gustave, Paris.
a Damocles, after Couture. 421
b Concina Family, after Veronese. 421
c The Virgin, "Belle Jardinière," after Raphael. 421
- 306 Levasseur, Jules Gabriel, Paris.
a Multiplication of Loaves, after Murillo. 421
b Dante, after Gerome. 421
- 307 Potemont, Adolphe Martial, Paris.
a The Marvellous, after T. Goupil, (etching). 421
b La Tonnellerie Street, Old Paris (etching). 421
- 308 Poncet, Jean Baptiste, Paris.
a Entry of Jesus into Jerusalem. 421
b Jesus Ascending Mount Calvary. 421
c Moses Prostrated before the Burning Bush. 421
- 309 Penel, Jules, Paris.
a St. Trinity Church. 421
b Abbatial Church of Vezelay. 421
- 310 Picq, Henry, Paris.
a Project of a monument to be erected at Lisbon in memory of the Emperor Don Pedro IV. 421
b Grand Salon Louis XVI. 421
- 311 Pichot, E., Paris.—Engravings. 421
- 312 Rajon, Paul Adolphe, Paris.—Etching. 421
- 313 Salle, E., Paris.—Engravings in Relief on Copper for Typographic Printing. 421
- 314 Union Centrale des Beaux Arts, Paris.—Engravings. 421
- 315 Varin, Eugene Napoleon, Paris.—Spring, after Cot. 421
- 316 Heldebran, H. Th., Paris.—Engravings on wood. 422
- 317 Laplante, Charles, Paris.
a A frame containing 9 engravings on wood executed for the "Tour du Monde" and History of France of Guizot. 422
b Wood engravings for History of France of Guizot. 422
- 318 Robert, Charles Jules, Paris.—Engravings on wood. 422
- 319 Thomas, Emile, Paris.
a Marshal Fries, after Regault. 422
b Master of the house, after a terra cotta of Carpioux. 422
c Turtles fighting, after Boyle. 422
- 320 Chevalier, Paris.—Lithographs. 423
- 321 Wuhrer, L., Paris.—Maps and Plans. 423
- 322 Aubry, Paris.—Imitation of Oil Paintings and Water Color Paintings. 424
- 323 Bognard, T. Jr., Paris.—Chromolithographic Paintings. 424
- 324 Bouasse, Lebel fils, Paris.—Engravings, Chromo-lithographs and Albums. 424
- 325 Bourgerie, Villette A., Paris.—Imitation of Paintings, Water-color Paintings, Labels, Decalcomania. 424
- 326 Chevalier, Paris.—Chromo-lithographs. 424
- 327 Crêhet, Paris.—Chromo-lithography. 424
- 328 Gueneux & Normand, E., Nantes.—Printing on metals in Chromo and Polychromo-lithography. 424
- 329 Goupil & Co., Paris.—Chromo-lithographs. 424
- 330 Legras, A., Paris.—Oleography or Chromo-lithography. 424
- 331 Pichot, E., Paris.—Chromo-lithography and ornamented labels. 424
- 332 Vacquerel, P. E., Paris.—Chromo-lithography. 424
- 333 Appert, E., Paris.—Photographs. 430
- 334 Bernond, Alphonse, Lyons.—Photographs. 430
- 335 Bray, J. de, Nice.—Nice and Environs. Photographs. 430
- 336 Devrez, Desiré Henry Louis, Paris.—Colored photographs of the Villa Honoré. 430
- 337 David, Victor, Paris.—Photographs. 430
- 338 Etex, Antoine, Paris.—Ingres Monument, photographs. 430
- 339 Girard, Jules, Paris.—Photo-micrographs. 430
- 340 Goupil & Co., Paris.—Photographs. 430
- 341 Laffon, Paris.—Photographs of art. 430
- 342 Levy, J. & Co., Paris.—Stereoscopic views on glasses and on paper. 430
- 343 Liebert, A., Paris.—Photographs. 430
- 344 Petit, Pierre, Paris.—Lyceums, superior Normal Schools of Paris. Photographs. 430
- 345 Quinet, Achille, Paris.—Photographs of landscapes and animals. 430
- 346 Walery, Paris.—Photographs. 430
- 347 Goupil & Co., Paris.—Photographs. 431
- 348 Yves & Barrett, Paris.—Photo-engravings. 431
- 349 Gillot & Son, Paris.—Photo-engravings. 432
- 350 Goupil & Co., Paris.—Photo-engravings. 432
- 351 Lefman, Paris.—Chemical engraving, photo-engraving, photo-lithography, copper-plate engraving. 432

Industrial Designs, Metal Work, Tiles.

- 352 Léon, Vidal, Paris.—Photo-chromic proofs. 432
- 353 Boucherat, Ch., Paris.—Designs for print on cretonne, designs for painted paper-hangings, and designs for dress. 440
- 354 Cillier, Constant, Paris.—Industrial designs. 440
- 355 Libert, Paris.—Industrial designs. 440
- 356 Troublé, Paris.—Paper-hanging designs. 440
- 357 Crepinet, A., Paris.—Project for the Church of the Sacré-Cœur at Montmartre, plan, section and elevation. 441
- 358 DeLalande, Charles Leon, Paris.—Renaissance Theatre, plans, elevations, sections, etc. 441
- 359 Devrez, Desiré Henry Louis, Paris.
a Project for the Sacré-Cœur Church of Montmartre, plans and elevations. 441
b Studies on the St. Michel Mount. 441
c Project of Altar of the Cathedral of Orleans. 441
- 360 Shewreux, Louis Ernest, Paris.—Project of construction of the Faculty of Sciences, plans and elevations. 441
- 361 Brunet, Paul, Paris.—Bronzes of art. 443
- 362 Christoffe & Co., Paris.—Goldsmith's art, prizes awarded by the Ministry of Agriculture and Commerce in country fairs. 443
- 363 Cornu, Eug. & Co., Paris.—Marbles, Algerian onyx, bronzes of art and furniture. 443
- 364 Froment, Meurice, Paris.—Goldsmith's art, prizes awarded by the Ministry of Agriculture and Commerce in country fairs. 443
- 365 Kaffel, Freres, Paris.—Fancy bronzes. 443
- 366 Lichtenfelder, Paris.—Artistic Lock. 443
- 367 Marchand, Louis Leon, Paris.—Bronzes of art and furnitures. 443
- 368 Michel, Louis, Toulouse.—Church ornaments and religious art. 443
- 369 Morel, A., Paris.—Bronzes of Art. 443
- 370 Poussielgue, Rusand, Paris.—Religious bronzes and goldsmith's art. 443
- 371 Perrot, Henry, Paris.—Bronzes of art. 443
- 372 Susse, Freres, Paris.—Bronzes of art and furniture. 443
- 373 Sauvage, François & Ruck, Henry, Paris.—Bronzes. 443
- 374 Boulenger, Aîné, Paris.—Incrusted mosaic square floor tiles. 451
- 375 Muller, E. & Co., Ivry, Seine.—Enameled terra-cotta from the vestibule of the exhibition pavilion of public works ministry. 451
- 376 Ollive, A., Paris.—Square floor tiles of French fayence. 451
- 377 Simons & Cie, Chateau Nord.—Ceramic sandstone mosaic tile flooring of the vestibule of the exhibition pavilion of the public works ministry. 451
- 378 Brocard, Ph. J., Paris.—Enameled glass. 453

GERMANY.

Sculpture, Engravings.

Sculpture.

- 1 Bavarian Technological Museum, Nurnberg.—Galvano-plastic copies. 401

Engraving and Lithography.

- 2 Mayer's, Carl, Art Establishment.—Oil-prints and steel engravings. 421
- 3 Duncker, Alexander, Berlin.—Copper-plate engravings and aquarelles. 421
- 4 Hunkel, Georg, Bremen.—Lithographic prints, copper-plate engravings. 421
- 5 Lenz, Friedrich, Berlin.—Lithographic work. 421
- 6 Technico-Typographic Institute.—F. Schmitt, Magdeburg.—Specimens of engraving. 421

- 7 Brükner & Co., Munich.—Chromolithographs. 424
- 8 Gaillard, Edm'd, formerly H. Gerold, Berlin.—Chromo-lithographs. 424
- 9 Steinbock, R., Berlin.—Chromolithographs. 424
- 10 Zettler, F. X., Munich.—Chromolithographs. 424
- 11 Boehme & Fränkel, Berlin.—Oil-prints. 424
- 12 Brandes & Wolff, Hanover.—Oil-prints. 424
- 13 Hösch & Frankenburger, Nuremberg.—Oil-prints. 424
- 14 Hoppe, E., & Co., Berlin.—Oil-prints. 424
- 15 Kaufman, A. & C., Berlin.—Oil-prints. 424

Engravings, Photographs, Decorations.

- 16 Siber, Carl, Berlin.—Oil-prints. 424
 17 Troitzsch, Otto, Berlin.—Oil-prints. 424

Photography.

COLLECTIVE EXHIBIT OF THE
SOCIETY FOR THE ADVANCEMENT OF
PHOTOGRAPHY.—PHOTOGRAPHS. 430

- 18 Loescher & Petsch, Berlin.
 19 Reichardt & Lindner, Berlin.
 20 Rückwardt, H., Berlin.
 21 Schaarwächter, J. C., Berlin
 22 Scholz, R., Görlitz.
 23 Albert, J., Munich.
 24 Rathenow Optical Industrial Establishment, formerly A. Busch, Rathenow.
 25 Herzog, J., Bremen.
 26 Falk, R., Berlin.
 27 Schultz & Suck, Carlsruhe.
 28 Remelé, Ph., Gastendonk, near Aldekerk.
 29 Mischewsky, R., Dantzig.
 30 Hennig, R., Berlin.
 31 Kiewning, Stettin.

- 32 Schwier, K., Weimar.
 33 Delden, van, Breslau.
 34 Vogel, H., Berlin.
 35 Köslér, J., Bad Landeck, Silesia.
 36 Jacobi, Neuendorf, near Coblenz.
 37 Kremer, J., M. Gladbach.
 38 Dauthendey, Würzburg.
 39 Obernetter, J. B., Munich.
 40 Hulei, F., Mosbach.
 41 Wolf, G., Hamburg.
 42 Braun, A., Dornach.
 43 Tielemann, Bernhard, Hanover.
 44 Reinecke, F., Hanover.
 45 Ritschel, G. A., Hirschberg, Silesia.
 46 Trapp & Münch, Friedberg, near Frankfurt-on-Main.—Albumen paper, plain and with photographs.

Industrial and Architectural Designs, etc.

- 47 Rham, Ferdinand, Boppard-on-the-Rhein.—Methods for wall painting. 442
 48 Trautmann, J. W., Breslau.—Decorations for interiors. 442

(The Art exhibit of Switzerland is exhibited in the Swiss section Main Building and catalogued in vol. I.)

NETHERLANDS.

Oil Paintings.

Paintings.

- 1 Cuypers, P. I. H. & Stolzenberg, Roermond.—Colored Wood representing a relief of the Crucifixion of the Holy Virgin and of St. Jovis. 410
 2 Goossens, Joh. & Son, s'-Bosch.—Saul on the road to Damascus. Statuette in terra cotta. 400
 3 Allebé, Auguste, Amsterdam.—The Nursery. 410
 4 Altmann, S., Amsterdam.
 a Jan Steen. 400
 b Petrus Plancius correcting Sea-Charts. 400
 5 Apol, L., The Hague.
 a Early Morning. 410
 b On the River. 410
 6 Altmann, S., Amsterdam.
 a Banquet of the Civic Guard, after VanderMeulen. 410
 b Five Masters of the Drapers, after Rembrandt. 410
 c The Young Bull, after P. Potter. 410
 d The Master of the Kloveniers Guild at Haarlem, after Frans Hals. 410
 7 Bosboom, J., The Hague.
 a The New Church at Amsterdam. 410
 b Holland Church. 410
 c Church of Trier. 410
 8 Borselen, J. W. van, The Hague.—Holland Landscape. 410
 9 Boks, M., The Hague.
 a Landscape. 410
 b Landscape. 410
 10 Bisschop, C., The Hague.
 a Dieuwke. 410
 b At Church. 410
 11 Bilders, J. W., Amsterdam.
 a Landscape. 410
 b Landscape. 410
 c Landscape. 410
 12 Borselen, J. W. van, The Hague.—Landscape. 410
 13 Cunaeus, C., Amsterdam.
 a Warm. 410
 b Cold. 410
 c Annexing 410
 14 Canta, J. A., Rotterdam,
 a The Summer. 410
 b After a Tiresome Day. 410

Oil Paintings.

- 15 Craeyvanger, R., Amsterdam.—The First Spectacles. 410
- 16 Deventer, W. A. van, The Hague.—Scheveningen. 410
- 17 Deventer, J. F. van, The Hague.
a Holland River Landscape. 410
b Holland Landscape with Cattle. 410
- 18 Destree, J., The Hague.—Dutch Meadow. 410
- 19 Eversen, A., Amsterdam.—View of the City in Winter Time. 410
- 20 Everdingen, A. van, Utrecht.
a Holland Landscape. 410
b On the River-side. 410
- 21 Essen, J. C. van, Amsterdam.—A Moment's Rest. 410
- 22 Eickelberg, W. H., Amsterdam.—Winter Landscape. 410
- 23 Eerelman, O., Brussels, Belgium.—A Directress of the Asylum for Orphans in Groningen. 410
- 24 Egenberger, J. H., Groningen.—Rain and Sunshine. 410
- 25 Ebersbach, J. D., Amsterdam.—Recreation. 410
- 26 Flier, H. R. van der, Baarn.—In the Stable. 410
- 27 Gruyter, W., Amsterdam.—Dutch Fisherman caught in a Storm. 410
- 28 Groot, J. de, Amsterdam.—Meditation. 410
- 29 Greive, J. C., jr., Amsterdam.
a The Y of Amsterdam. 410
b The Dock of Amsterdam. 410
- 30 Gempt, B. H., Amsterdam.
a Three Dogs. 410
b One Dog. 410
c The Cat feigns to be Hanged. 410
- 31 Heerebaart, G., Amsterdam.—A Dutch Town in Stormy Weather. 410
- 32 Heemskerk, J. E. van Beest, The Hague.
a Off the Island of Texel. 410
b Storm near Dover. 410
c The Y of Amsterdam. 410
- 33 Hazeu, A. C., Haarlem.—Landscape in Gelderland. 410
- 34 Hanrath, Theod., Amsterdam.—A Peddler. 410
- 35 Haanen, Miss Adriane, Oosterbeck.—Summer. 410
- 36 Hanedoes, L., The Hague.—Woodland with Figures. 410
- 37 Heemskerk, van Beest, J. E., The Hague.—Arrival in a Port with Average. 410
- 38 Huybers, J. D., Zwolle.—Four weeks after St. John's day. 410
- 39 Hove, J. H. van, The Hague.—Happy News. 410
- 40 Hove, B. J. van, The Hague.—View of part of St. Hypolitus Church at Delft. 410
- 41 Hollander, H., Amsterdam.—Rembrandt selling his Picture in Hague. 410
- 42 Hilverdink, Joh., Amsterdam.—Landscape on the Mediterranean Coast. 410
- 43 Hilverdink, E. Alex., Amsterdam.—View on the Binnen-Amstel in Amsterdam. 410
- 44 Heyl, M., Amsterdam.—Evening. 410
- 45 Henkes, Gerke, The Hague.—A moment of Expectation. 410
- 46 Joosten, D. J. H., Haarlem.—Still Life. 410
- 47 Israels, J., The Hague.
a The Players. 410
b By the Grainfield. 410
c After the Storm. 410
- 48 Kruseman, H. D. van Elten, New York, N. Y.—Landscape in Holland. 410
- 49 Koster, E., Haarlem.
a Still Water near Dordrecht. 410
b On the Beach. 410
c View on the Y in Amsterdam. 410
- 50 Kool, S., Amsterdam.—Saturday afternoon in Friesland. 410
- 51 Koekkoek, W., The Hague.—Street Scene at Kuilenburg. 410
- 52 Koekkoek, H. P., London, England.—Landscape near Quilsford (Eng.) 410
- 53 Koekkoek, H., Amsterdam.—Beach on the French Coast. 410
- 54 Koekkoek, Jr., H., London, England.—Stormy Weather at Sea. 410
- 55 Kluyver, P. L., Amsterdam.—Winter Evening near Amersfoort. 410
- 56 Kever, J. S. H., Amsterdam.—The Artist. 410
- 57 Kellen, D. van der, Amsterdam.
a Secrets. 410
b No Bad News. 410
- 58 Kate, J. M. H. ten, The Hague.
a Good Friends. 410
b On the Beach. 410
- 59 Kate, Herman F. C. ten, The Hague.
a The Fortunes of War, XVII. Century. 410
b Gamblers, XVII. Century. 410
c A Morning Concert, XVIII. Century. 410
- 60 Lokhorst, D. van, Utrecht.—Heathfield, near Epe. 410
- 61 Lingeman, L., Baarn.
a Trial of a Prisoner of War. 410
b A Dutch Scholar of the Seventeenth Century. 410
c A Conference. 410
- 62 Mesdag, Mrs., The Hague.—In the Downs. 410
- 63 Mesdag, H. W., The Hague.
a Storm on the North Sea. 410
b Evening on the Beach. 410
c Winter near the Hague. 410
- 64 Masurel, J. E., Amsterdam.—Relief. 410
- 65 Mauve, A., The Hague.—Tugging of the Fisher-boat. 410
- 66 Martens, W. J., Rome, Italy.—The Messenger of Peace, Vestibule of St. Mark's Church at Venice. 410
- 67 Maaten, J. van der, Apeldoorn.—On the Channel at Apeldoorn. 410
- 68 Maris, W., The Hague.—The First Swimming Lesson. 410
- 69 Nakken, W. C., The Hague.
a Pack-Horses in the Woods of St. Gaten. 410
b Hay-Making, Normandy. 410
- 70 Oppenoorth, W. J., Antwerp, Belgium.
a A Pool at Lent in the Evening. 410
b Drinking-place near the Entrance to the Woods. 410
- 71 Postma, G., Haarlem.—The Barber of Seville. 410

Paintings, Engravings, Photographs.

- 72 Philippeau, C. F., Amsterdam.—On the Lookout. 410
- 73 Paling, Joh. J., Amsterdam.—Sunday Morning. 410
- 74 Rust, J. A., Amsterdam.—View of Amsterdam, Sixteenth Century. 410
- 75 Roth, G. A., Amsterdam.—Water-mill at Vorden. 410
- 76 Ronner, Mrs. H., Brussels.
a The Last Hope 410
b Hare in His Covert. 410
- 77 Roelofs, W., Brussels.
a Landscape. 410
b Landscape. 410
- 78 Rochussen, Ch., Rotterdam.
a Cheese Market in a Town of North Holland. 410
b Excursion in Day-time. 410
c Excursion in Moonlight. 410
d Reconnoitring. 410
e Scheveningue. 410
- 79 Reintjes, H. E., Amsterdam.
a Twenty and Eighteen. 410
b Sixty-five and Fourteen. 410
- 80 Riegen, N., Amsterdam.
a Still Water in the Evening. 410
b Coast Scene in France. 410
- 81 Rebecque, W. C. de Constant, Loosduinen.—In the Port of Moerdyk. 410
- 82 Roelofs, W., Brussels.—Thunderstorm. 410
- 83 Sande, Bakhuisen, J. v. d., The Hague.—River Landscape. 410
- 84 Stortenbeker, P., The Hague.—Landscape. 410
- 85 Stroebel, J. A. B., The Hague.—The Deacons of the Silversmith's Guild conferring a Freeman's Certificate (XVII century). 410
- 86 Steffelaar, J., Amsterdam.—In the Convent Kitchen. 410
- 87 Springer, C., Amsterdam.—View in Torenstreet at Enkhuysen. 410
- 88 Seggren, F. van, Amsterdam.
a Evening. 410
b Fox-hunting. 410
- 89 Soeterik, Th., Utrecht.—The Castle's Solitude. 410
- 90 Scholten, J. H., Haarlem.
a Sunday Morning. 410
b Summer Flowers. 410
- 91 Schipperus, P. A., Rotterdam.—Dutch Landscape. 410
- 92 Schenkel, J., Amsterdam.
a Church of St. Nicholas, Amsterdam. 410
b Cathedral at Breda. 410
c The New Church in Amsterdam. 410
- 93 Savry, H., Haarlem, Amsterdam.—Pastoral Scene near Haarlem. 410
- 94 Sadeé, Ph., The Hague.—Gleaning. 410
- 95 Baxhuysen, Mrs. G. J., van de Sande, The Hague.
a Bouquet of Roses. 410
b Fruit. 410
- 96 Trigt, H. A. van, Hilversum.—Norwegian Baptism of Children. 410
- 97 Tom, J. B., The Hague.—Heath with Sheep. 410
- 98 Testas, W. de Famars, Brussels.—A Barber Shop in Cairo. 410
- 99 Taanman, J., Amsterdam.
a On his Post. 410
b Sheriff's Office in the Old City-house of Kampen. 410
- 100 Taanman, J., Amsterdam.—Flower Girl. 410
- 101 Vos, Miss M., Oosterbeek.—Still Life. 410
- 102 Vogel, J. G., The Hague.
a Dutch Landscape. 410
b Heath. 410
- 103 Vester, W., Heemstede.—Woody Landscape in Holland. 410
- 104 Verveer, E., The Hague.—The Widow. 410
- 105 Verschuur, Jr., W., Amsterdam.
a Horse in his Stable. 410
b Dog. 410
- 106 Valkenburg, H., Amsterdam.—Domestic Happiness. 410
- 107 Vos, Miss M., Oosterbeek.—Still Life. 410
- 108 Verveer, S. L.—Scheveningen. 410
- 109 Windt, P., The Hague.—Tough Beans. 410
- 110 Weissenbruch, The Hague.—Leerdam. 410
- 111 Sluyter, Dz. H.—Fourteen engravings. 421
- 112 Tresling, P. O., Amsterdam.—Chromo-lithographs. 424
- 113 Bauer, C. W., Middelburg.—Photographs. 430
- 114 Kolkow, F. I. von, Gronigen.—Photographs and microscopical photographs. 430
- 115 Jong, G. de, Groningen.—Photographs. 430
- 116 Wollrabe, H. W.—Photographs. 430
- 117 Molkenboer, W. B. G., Leeuwarden.—Drawings of the Sarphati-Monument, in Amsterdam. 441

DENMARK.

Sculpture, Paintings, Engravings, Designs.

- | | |
|--|---|
| 1 Hasselrüs, L., Copenhagen, Denmark.—Hein. Heine (marble statue). 400 | 9 Melby, Wilhelm, Member of Royal Academy, Copenhagen.—A Midsummer's Night, under Iceland's rough weather. 410 |
| 2 Fjeldskov, V., Copenhagen.—Carving in wood, statuetts, medals, etc. 405 | 10 Mackeprang, A., Copenhagen.
a The Fox in the Chicken Yard. 410
b Fox and its Young. 410 |
| 3 Anderson, A., Copenhagen.
a Winter Landscape. 410
b Afternoon in a Danish Beech Forest, Winter. 410 | 11 Rasmussen, J. E. C., Copenhagen,
a The Discovery of America by Greenland, in the year 1000. 410
b Greenlanders on a Journey. 410
c Two Greenland Pilots. 410
d Danish Fjord. 410 |
| 4 Bache, Otto, Copenhagen.—The Struggle. 410 | 12 Schovelin, A., Copenhagen.—The Ruins of Heidelberg. 410 |
| 5 Eckardt, C., Copenhagen.
a The Harbor of Genoa. 410
b The Coast of Spalato, Dalmatien. 410 | 13 Sörensen, Prof. C. F., Member of Royal Academy and Ridder of Dannebrog, Copenhagen.—Sunset on the Atlantic, an Old Frigate in a Gale. 410 |
| 6 Hansen, Prof. H., Member of Royal Academy and Ridder of Dannebrog and Dannebrog Mend.—Paintings. 410 | 14 Ferslew, C. & Co., Copenhagen.—Lithographs. 413 |
| 7 Hammer, H. J., Member of Royal Academy and Ridder of Dannebrog, Copenhagen.—By the Fountain in Ariccia, Italy, after Sunset. 410 | 15 Hetsch, Chr., Copenhagen.—Architectural designs. 441 |
| 8 Hammer, William, Copenhagen.
a A variety of fruit, under an apple tree. 410
b Various garden fruit in a basket. 410 | |

SWEDEN.

Sculpture, Carving, Painting.

- | | |
|--|---|
| 1 Berg, Oscar, Rome, Italy.—Pan and Psyche. 400 | 9 Arborelius, O. P., Stockholm.
a View from Dalarne. 410
b Winter Landscape. 410 |
| 2 Börjeson, J., Rome, Italy.
a The Ladies of the Lake. 400
b Psyche. 400 | 10 Börjesson, Miss Agnes, Rome.
a Farewell. 410
b A Happy Finding. 410 |
| 3 Mesch, J. A., Sundsvall.—Bear Hunting (group in terra cotta). 400 | 11 Brandelius, P., Stockholm.—Dangerous Excursion. 410 |
| 4 Lundmark, Aug., Stockholm.—Carvings in wood. 405 | 12 Boklund, J. Ch., Stockholm.
a Marodeur Pursuing his Prey. 410
b Consultation. Gustav. Adolph. II. and Three Warriors. 410 |
| 5 Ostergren, I. P., Westeras.—Carvings in wood. 405 | 13 Billing, Th., Stockholm.—Landscape in North Sweden. 410 |
| 6 Wästfelt, Carl, C'son, Kölingsholm.—Carving in wood. 405 | 14 Bergstedt, Miss Amanda, Stockholm.—Returned Lesson. 410 |
| 7 Adelsköld, C., Stockholm.
a Preparing for Dinner. 410
b A Gale on the Coast of Sweden. 410
c A Night on the Ocean. 410
d Summer Night at the Coast of Bohus Län. | 15 Bergman, Miss Elisabeth, Stockholm.—Landscape in Vermland. 410 |
| 8 Ankarkrona, H., Stockholm.
a Evening Prayer in the Desert. 410
b View from Boundaries of Algiers and Morocco 410 | 16 Berg, Edw., Stockholm.
a Fishing Harbor on the Coast of Bohus, Sweden. 410
b Birch Forest. 410
c Waterfall in Smoland. 410
d Interior View of Pine Forest. 410 |

Oil Paintings.

- 17 Berg, Alb., Stockholm.
a Marine. 410
b View from Stockholm's Skärgård, Archipelago. 410
c Winter in the Skärgård. 410
d Moonlight. 410
- 18 Cederström, G., Baron, Stockholm.—Dark Moments. 410
- 19 Cedergren, P. N., Stockholm.—View of Stockholm. 410
- 20 Cantzler, H.
a Northern Landscape. 410
b Reaping in Italy. 410
- 21 Dietrichson, Mrs. M., Christiania, Norway.—The Recovered Document. 410
- 22 Engström, W. O., Düsseldorf, Germany.
a Good-Morning. 410
b Bird of Prey Carrying Off a Rabbit. 410
- 23 Ekström, P., Stockholm.—Summer Evening. 410
- 24 Fahlgren, C. A., Stockholm.—Landscape. 410
- 25 Fagerlin, F., Düsseldorf, Germany.
a The Convalescent. 410
b Smoking Boys. 410
c Jealousy. 410
- 26 Holmlund, Miss Josefina, Stockholm.—Frederika Bremer's First and Last Home. 410
- 27 Holst, J. G. von, Stockholm.
a Sheep on the Pasture. 410
b A Fruitless Attempt. 410
- 28 Holm, P. D., Stockholm.
a In the Mining Districts of Wermland. 410
b In the Forest. 410
- 29 Hertzberg, A. G., Düsseldorf, Germany.—Young Girl going to the Lord's Supper. 410
- 30 Hellquist, H., Paris, France.—Genre. 410
- Water Colors.**
- 31 Hafström, A. G., Düsseldorf, Germany.—A Captured Frenchman. 410
- 32 Hermelin, Olof, Baron, Commissioner of the Swedish Art Department, Stockholm.
a Winter Day in the Neighborhood of Stockholm. 410
b Poor People's Graveyard, near Stockholm. 410
c The First Snow. 410
d Fishing Harbor near Stockholm. 410
e On Mont Martre, Paris. 410
f In a Stockholm Suburbe. 410
g The Church of St. Pierre, Paris. 410
h Returning Home. 410
i Landscape in Södermanland. 410
k Birch Forest. 410
l Autumn Day at Djurgården, Stockholm. 410
m Fishing place near Stockholm. 410
- 33 Jernberg, Olof, Düsseldorf, Germany.—Swedish Landscape. 410
- 34 Jernberg, Aug., Düsseldorf, Germany.
a Market Day in Düsseldorf. 410
b The Broken Pipe. 410
c Preparations to Festivals. 410
d Visitors in the Amsterdam Museum regarding Rembrandt's Night Watch. 410
- 35 Kallenberg, And., Berlin, Germany.
a Cattle in Skone. 410
b Beech Forest. 410
c Farm house in Skone. 410
- 36 Koskull, A. G., Baron, Stockholm.—The Bay and Waves. 410
- 37 Klörbel, C. F., Dijon, France.—Dogs attacking a Fox. 410
- 38 Kulle, Jac., Stockholm.—Wedding Attendance in Skone. 410
- 39 Lonnroth, Fr., Boroo.—Norwegian Horse. 410
- 40 Löfgren, Miss Klara, Stockholm.—Sorrow. 410
- 41 Lindman, A., Stockholm.—Evening at the West Coast of Sweden. 410
- 42 Lindegren, Miss Amalia, Stockholm.
a Father Returned from Market. 410
b Merriment at Home. 410
c Girl with an Orange. 410
- 43 Lagerholm, Miss Wilhelmina, Stockholm.—A Mother's Grief. 410
- 44 Malmström, J. Aug., Stockholm.—Dance of Elves. 410
- 45 Nordlander, Miss Anna, Stockholm.—The Toilet of the Favourite. 410
- 46 Nordgren, Axel, Düsseldorf, Germany.
a View at the Promontory Kullen in Skone. 410
b Coast Scenery. 410
- 47 Nordgren, Miss Anna, Paris, France.
a Italian Girl. 410
b Genre. 410
- 48 Nordenberg, B., Düsseldorf, Germany.
a Dalecarlians put to Flight by a Fire in the Forest. 410
b Wedding in a Swedish Country Church. 410
c Rest in a "Säter," Alpine Dairy-house. 410
d The Killed Sheep. 410
- 49 Nilsson, Severin, Paris.
a Sigurd Ring, King of Scandinavia and Engl, Burning Himself and his Killed Bride. 410
b The King of the Children. 410
c Brother and Sister. 410
- 50 Post, Miss Christine, von, Paris, France.—The Five Foolish Virgins at the Locked Door. 410
- 51 Perseus, Edward, Stockholm.—Parman Maid. 410
- 52 Palm, G. W., Stockholm.—View of Stockholm. 410
- 53 Rydberg, G. F., Stockholm.
a Winter Landscape. 410
b Spring Landscape. 410
c Landscape in Blekinge. 410
- 54 Rosen, Count G. von, Stockholm.—Portrait of E. v. Rosen, the Founder of the Swedish Railroads. 410
- 55 Ribbing, Miss Sophie, London, England.
a Girl with Grapes. 410
b Girl at the Säter. 410
c The Gardener's Children. 410
d Girl with Eggs. 410
- 56 Sidwall, Miss Amanda, Paris.—Mulatto woman. 410
- 57 Södergren, Miss Sophie, Paris.—French Coast Landscape. 410
- 58 Svenson, Fr., Stockholm.—H. M. Frigate "Vanadics." 410
- 59 Salomon, Geskel, Stockholm.
a Maid with an Open Letter. 410
b At the Letter-box. 410
c Religious Ceremony at the Coast of Algiers. 410

Paintings, Engravings, Photographs.

- | | |
|---|-----|
| 60 Schwerin, Miss, Amelie, von, Düsseldorf, Germany. | |
| <i>a</i> Landscape with Cattle. | 410 |
| <i>b</i> Landscape with Cattle. | 410 |
| 61 Skonberg, C. E., Paris, France.—Interior of Beech Forest. | 410 |
| 62 Törna, O., Düsseldorf, Germany. | |
| <i>a</i> Pine Forest, Sweden. | 410 |
| <i>b</i> Moonrise, Sweden. | 410 |
| <i>c</i> Birch Forest, Sweden. | 410 |
| 63 Virgin, A. J. G., Stockholm. | |
| <i>a</i> Letterbox, motive from Rättoik, Dalarne. | |
| <i>b</i> On the Meadows, motive from Orsa, Dalarne. | 410 |
| 64 Winge, Mrs. M., Stockholm. | |
| <i>a</i> Sunday Morning at the Church of Rättoik, Dalarne. | 410 |
| <i>b</i> Before Service. | 410 |
| 65 Winge, M. E., Stockholm. | |
| <i>a</i> Signe and Hagbard. | 410 |
| <i>b</i> Viking Fleet. | 410 |
| 66 Werner, G., Naples, Italy.—The Salamander. | 410 |
| 67 Wallander W. & Forslow H., Stockholm. | |
| <i>a</i> Shepherd Making Fire, the Smoke of which keeps off the Mosquitoes from the Cattle. | 410 |
| <i>b</i> Saturday Night on the Alpine Pasture. | 410 |
| 68 Wallander, W., Stockholm.—Forge in the Forest. | 410 |
| 69 Wahlquist, E., Sigtuna. | |
| <i>a</i> Hunting Party. | 410 |
| <i>b</i> The Fortress Kronoborg. | 410 |
| <i>c</i> Smugglers. | 410 |
| 70 Wahlberg, H. A. L., Paris, France.—Landscape in Moonlight. | 410 |
| 71 Zetterström, Mrs. M., Paris.—What does she think of? | 410 |
| 72 Ahrenberg, J., Stockholm.—City Gate of Rouen. | 410 |
| 73 Blackstadius, J. L., Stockholm. | |
| <i>a</i> Miller's Cottage at Alvastra. | 411 |
| <i>b</i> In Stockholm's Skärgård. | 411 |
| 74 Gardell, Miss Anna, Stockholm. | |
| <i>a</i> Views from Skona. | 411 |
| <i>b</i> A Spring Day. | 411 |
| 75 Hägg, J., Stockholm. | |
| <i>a</i> In the River at Stockholm. | 411 |
| <i>b</i> Man of War. | 411 |
| <i>c</i> Sea picture. | 411 |
| <i>d</i> Sea picture. | 411 |
| 76 Kylberg, Miss Regina, Stockholm.—The Halsfors in Norway. | 411 |
| 77 Larson, Miss Virginia, Stockholm. | |
| <i>a</i> Paysant Girl from Dalarne. | 411 |
| <i>b</i> Swedish Landscape. | 411 |
| 78 Malström, J. A., Stockholm.—Drawings. | 411 |
| 79 Sandberg, N., Stockholm.—Coal drawings. | 411 |
| 80 Meyer, W., Stockholm.—Wood engravings. | 422 |
| 81 Centraltryckeriets Aktiebolag, Stockholm.—Lithographical products. | 423 |
| 82 Cardon, J., Stockholm.—Lithographs. | 423 |
| 83 Huldberg, F., Stockholm.—Lithographs. | 423 |
| 84 Litografiska, Aktiebolaget, Norrköping.—Lithographical products. | 423 |
| 85 Reuterdaahl, F. R., Jr., Malmö.—Lithographs. | 423 |
| 86 Florman, G., Stockholm.—Photographs. | 430 |
| 87 Huldberg, F., Stockholm.—Photographs. | 430 |
| 88 Löfström, Miss Sophie, Uppsala.—Photographs. | 430 |
| 89 Lundberg, W. A., Stockholm. | |
| <i>a</i> Photographs on paper. | 430 |
| <i>b</i> Photographs on glass. | 430 |
| 90 Lindahl, Axel, Göteborg.—Photographs. | 430 |
| 91 Osti, Henr., Uppsala.—Photographs. | 430 |
| 92 Roesler, R., Stockholm.—Photographs on wood, copper, engravings. | 430 |
| 93 Wiklund, O., Westeros.—Photographs. | 430 |
| 94 Carleman, C. G. W., Stockholm.—Photo-engravings. | 431 |
| 95 Lilijeström, Ansh., Stockholm.—Project of a Theatre. | 441 |

NORWAY.

Paintings.

Paintings in Oil.

- | | |
|---|--|
| 1 Anker, Herm., Christiania. | |
| <i>a</i> Scenery in Romsdalen. | |
| <i>b</i> Scenery near Loen in Nordfiord. | |
| 2 Askevold, A., Bergen. | |
| <i>a</i> Summer Day at the Mountain-tarn. | |
| <i>b</i> Evening on the Mountain-pastures (chalet). | |
| 3 Arbo, P. N., Christiania.—"Day," Mythological subject. | |
| 4 Bergh, Anton, Christiania.—Folgefonden, glacier in Hardanger. | |
| 5 Boe, Frantz, Bergen. | |
| <i>a</i> Flowers. | |
| <i>b</i> Fruits. | |
| <i>c</i> Midnight Sunlight in Norway. | |

Paintings, Carving, Photographs, Sculpture.

- 6 Bennetter, J. J., Paris.
a Vikings at Sea. Moonlight and Storm.
b Sea-fight between the Frigate "la Preneuse" and the line-of-battle-ship "Jupiter" on the Heights of Le Banc des Aiguilles, 26 Sept., 1799.
- 7 Baade, Knud, Munich.—Subject from the Norwegian Coast.
- 8 Dahl, Hans, Bergen.—Figure-painting, subject from the Western Norway.
- 9 Diesen, And. E., Carlsruhe.—Mountain-scenery.
- 10 Grimelund, J. M., Paris.—A Summer-morning in the Birch-forest.
- 11 Gude, Hans, Professor, Carlsruhe.
a A Fresh Breeze, Norwegian Coast.
b Calm, Christianiafiord.
c View from Drobak, near Christiania.
- 12 v. Hanno, W., Christiania.—Subject from Braunschweig.
- 13 Hygen, Bernitz, Christiania.
a View in the Christianiafiord.
b Scenery in Nordmarken, near Christiania.
- 14 Jacobsen, S., Düsseldorf.—Winter-scenery.
- 15 Lerche, Vinc. St., Düsseldorf.
a Studio in a Monastery.
b Interieur "
- 16 Lorck, Karl J., Düsseldorf.—The Elk-hunters.
- 17 Moller, Niels B., Düsseldorf.
a The Kirkevig near Lysekil, Sweden.
b Moonshine, Lysekil.
c Waterfall in Telemarken, Norway.
d From Fjærland, Sognefiord, Norway.
- 18 Nicolaysen, L. W., Christiania.—Norwegian Landscape, from the Lake Bandak in Telemarken.
- 19 Nielssen, Johan, München.—Approaching Thunder-storm, Lofoten Islands, Norway.
- 20 Nielsen, Amaldus, Christiania.
a Scenery in the Sognefiord, Norway.
b The Vingeraashei, Telemarken.
c Towards Evening.
- 21 Norman, A., Düsseldorf.
a Scenery in the Romsdalsfiord.
b Landscape from Lærdal, Sognefiord.
c Norwegian Fjord.
- 22 Rummelhoff, Chr., Arendal.
a Morning, Faleide in Nordfiord.
b After Rain, subject from the Sorfiord.
- 23 Sinding, Otto, Munich.
a Ruth and Boas.
b Fight at a Christmas-feast.
- 24 Skari, E. O. R., Christiania.—French Fishermen in the Channel.
- 25 Schanche, Herm. G., Düsseldorf.—The Folgefonde, glacier in Norway.
- 26 Smith-Hald, F., Düsseldorf.
a Winter Day, Bohuslän, Sweden.
b Winter Evening at the Swedish Coast.
- 27 Schive, Jacob, Düsseldorf.—Norwegian Winter Landscape.

- 28 Thaulow, Fritz, Christiania.
a Scene from the Ice-channel, Christianiafiord.
b On the Thames.
c Midsummer Night on the Norwegian Coast.
- 29 Thurman, P., Christiania.—Hardangerfiord.
- 30 Ulfsten, Carlsruhe.—Moonrise on the Norwegian Coast.
- 31 Wexelsen, Chr., Christiania.—Scenery from Sorfiorden, Hardanger.
- 32 Vigdal, A. G., Bergen.—Waterfall, subject from Vos.

Paintings in Water Colors.

- 33 Lerche, Vinc., St., Düsseldorf.—Illustrations of popular rhymes and nursery tales, 13 aquarelles. Price for the set 300 dollars.

Wood Carving.

- 34 Fladmoe, T. C., Christiania.—Wood-carvings, designs for wood-carvings, and designs for Norwegian domestic industry.
- 35 Hansen, H., Christiansand.—Carvings in wood and ivory.
- 36 Kaarstad, J. O., Drammen.—Wood-carvings.
- 37 Simonsen, P., Christiania.—Wood-carvings by Ole Olsen Moene in Opdal.

Photography.

- 38 Aubert, E. E., Christiania.
- 39 Carstens, B. A., Vossevangen.—Photographs on paper.
- 40 Klem, Frederic, Christiania.—Photograph portraits.
- 41 Knudsen, Claus, Christiania.—Photograph portraits.
- 42 Knudsen, K., Bergen.—Photographs on paper.
- 43 Petersen, Peter, Christiania.
a Photographs of antiquities belonging to the University of Christiania.
b Fac-simile of antique Norwegian codices (Kongespeilet and Didrik of Berns Saga).
- 44 Petersen, Peter Christiania.—Electrotype copies of Scandinavian Gold-Brateates.
- 45 Szacinski, L., Christiania.—Photograph portraits.

Sculpture.

- 46 Borch, Chr., Rome.
a Jephtha's Daughter (Judges xi. 31). Statue of marble, natural size.
b Morning and Evening. Two statues of marble, half natural size, with pedestal.
c Sulamith, from the Song of Solomon, statue of plaster, natural size.
- 47 Sinding, Stephan, Christiania.
a Hermes, statue of marble, natural size.
b Volund, statue of plaster, natural size.

ITALY.

Sculpture, Cameos, Carvings, Photographs, Mosaics.

- 1 Boschetti, Benedetto, Rome.—Copy in bronze. 400
- 2 Becucci, L. & R. Brothers, Florence.—Marble statues, serpentine vases. 400
- 3 Boni, Andrea, Milan.—Statues for decoration. 400
- 4 Bellezza, Niccolo Alessandro, Rome.—Bronze statues. 400
- 5 Chiapparelli, Pietro, Rome.—Copies in bronze. 400
- 6 Ceriani, Giuseppe, Milan.—Bronzes. 400
- 7 Cecchi, Carlo, Volterra, Pisa.—Alabaster works. 400
- 8 Galli Brothers, Pietro & Leopoldo, Florence.—Copies of bronze statues. 400
- 9 Leoni, Angelo, Catania.—Statues of baked clay. 400
- 10 Nelli, Alessandro, Rome.—Copy in bronze. 400
- 11 Porcinai, Giuseppe, Florence.—Marble figures. 400
- 12 Romanelli Brothers, Florence.—Alabaster statues. 400
- 13 Capannini Car., Giuseppe, Rome.—Cameos. 404
- 14 Francati & Santamaria, Rome.—Cameos. 404
- 15 Siotto, Pio, Rome.—Cameos. 404
- 16 Baccetti, Andrea, Florence.—Sculpture in wood. 405
- 17 Bazzanti, Pietro & Brothers, Florence.—Sculpture in wood. 405
- 18 Brogi, F. & Co., Sienna.—Sculpture in wood. 405
- 19 Barbetti, Rinaldus, Florence.—Sculpture in wood. 405
- 20 Carrara, Pasquale, Bergamo.—Sculpture in wood. 405
- 21 Chamber of Commerce of Sienna, for Messrs. Guidi, Goti and Querei, Sienna.—Sculpture in Wood. 405
- 22 Ducci, Carlo, Florence.—Sculpture in wood and ivory. 405
- 23 Frullini, Prof. Luigi, Florence.—Sculpture in wood. 405
- 24 Ferri & Bartolozzo, Florence.—Sculpture in wood. 405
- 25 Gargini, Cesare, Florence.—Sculpture in wood. 405
- 26 Giani, Prof. Egistus, Florence.—Sculpture in wood. 405
- 27 Mattarelli, Adolfo, Florence.—Sculpture in wood. 405
- 28 Morini, Francesco, Florence.—Sculpture in wood. 405
- 29 Ottajano, Prof. Luigi, Naples.—Sculpture in wood. 405
- 30 Picchi, Andrea, Florence.—Sculpture in wood. 405
- 31 Paneieur, Besarel Valentino & Brothers, Venice.—Sculpture in wood. 405
- 32 Petralli Brothers, Florence.—Sculpture in wood. 405
- 33 Romanelli, Ferdinando, Florence.—Sculpture in wood. 405
- 34 Romagnani, Benedetto, Pistoja, Florence.—Ebony work. 405
- 35 Ravacci, Ferd. & Co., Milan.—Carved wood. 405
- 36 Ricciarelli, Secondus, Lucca.—Sculpture in wood. 405
- 37 Accaristi, Ludovico, Florence.—Copies from Original Paintings. 410
- 38 Pisani, Luigi, Florence.—Copies of Original Paintings. 410
- 39 Romoli, Cav., Prof. Luigi, Florence.—Copies of Paintings. 410
- 40 Chiari, Pietro, Arezzo.—Pen and Ink design. 420
- 41 Barelli, Pietro, Milan.—Engravings. 421
- 42 Visconti, Ciro, Palermo.—Lithographic Album. 423
- 43 Frauenfelder, G., Palermo.—Chromo Lithographic Album. 424
- 44 Libreria, Spitzöver, Rome.—Chromo-lithography. 424
- 45 Terzi, Andrea, Palermo.—Chromo-lithographic Album. 424
- 46 Guidi, Federigo & Billi, Ermegildo, Florence.—Photography. 430
- 47 Maija, Carlo, Venice.—Photographs. 430
- 48 Tagliarino, A. & Co., Palermo.—Photographs. 430
- 49 Verzaschi, Enrico, Rome.—Photographs. 430
- 50 Cartufi, Luigi, Rome, Architecture. 441
- 51 Canedi, Eng. Gaetano, Milan.—Architectural Designs. 441
- 52 Mazzotti, Achille, Rome.—Architecture. 441
- 53 Petrucci, Eng. Antonino, Palermo.—Architectural Design. 441
- 54 Preda, Prof. Antonio, Bergamo.—Design for Architectural Works. 441
- 55 Partini, Cesare, Rome.—Architecture. 441
- 56 Bianchini, Telemaco, Florence.—Mosaics. 450
- 57 Betti, Francesco, Florence.—Mosaics. 450
- 58 Bazzanti, Pietro & Brothers.—Florence.—Mosaics. 450
- 59 Boncinelli, Gio. & Sons, Florence.—Mosaics. 450
- 60 Brunacci, Pietro Fiesole, Florence.—Mosaics. 450

Mosaics.

- | | |
|--|--|
| 61 Civita, Angelo, Florence.—Mosaics. 450 | 71 Olivieri, Luigi, Venice.—Mosaics. 450 |
| 62 Francati & Santamaria, Rome.—Mosaics. 450 | 72 Orlandini, Leopoldo, Florence.—Mosaics. 450 |
| 63 Falcini, Andrea, Florence.—Mosaics. 450 | 73 Profili, Ulisse, Rome.—Mosaics. 450 |
| 64 Framolini, Titus, Florence.—Mosaics. 450 | 74 Roccheggiani, C., Rome.—Mosaics. 450 |
| 65 Gallandz, L. A., Rome.—Mosaics. 450 | 75 Scappini, Giovanni, Florence.—Mosaics. 450 |
| 66 Mattarelli, Adolfo, Florence.—Mosaics. 450 | 76 Sandrini, Antonio, Florence.—Mosaics. 450 |
| 67 Montelatici, Guiseppe, Florence.—Mosaics. 450 | 77 Scarselli, Nicola, Florence.—Mosaics. 450 |
| 68 Montelatici, A. & Brother, Florence.—Mosaics. 450 | 78 Torrini, Giocondo, Florence.—Mosaics. 450 |
| 69 Moglia, Augusto, Rome.—Mosaics. 450 | 79 Ugolini, Giovanni, Florence.—Mosaics. 450 |
| 70 Norelli, Luigi & Co., Florence.—Mosaics. 450 | 80 Vichi, Ferdinando, Florence.—Mosaics. 450 |

MEXICO.

Sculpture, Paintings.

- | | |
|--|---|
| 1 Calvo. | 21 Casarrin, Alexandro.—Painting. 410 |
| <i>a</i> Group. 400 | 22 Davila, Daniel.—Rubens in the study of his master. 410 |
| <i>b</i> Figure. 400 | 23 Dumaine.—The road to Chaputtepéc. 410 |
| 2 Dumaine.—The Orphans. 400 | 24 Enriquez, Nicolas.—Apparition of the Holy Virgin to different Saints. 410 |
| 3 Fernandez, J.—Sculpture. 400 | 25 Echave, Baltazar de.—Martyrdom of St. Peter. 410 |
| 4 Guerea, Gabriel.—A fisherman. 400 | 26 Flores, Rafael.—Dante. 410 |
| 5 Noreña.—Group. 400 | 27 Figuera, Gregorie.—Adam and Eve. 410 |
| 6 Sojo.—Group of Mercury and Argos. 400 | 28 Ferrando, Salvador.—Jacob the Father of the Israelites. 410 |
| 7 Salot, J.—Galatea. 400 | 29 Gutierrez, Rodrigo.—Ariande. 410 |
| 8 Valero, Felipe.—St. Sebastian. 400 | 30 Gutierrez, Felipe.—San Sebastian. 410 |
| 9 Montenegro, Guadalupe.—Model of artist's easel. 405 | 31 Hernandez, Ignacio.—Portrait of Mina. 410 |
| 10 Antonio, José.—Allegoria. 410 | 32 Lopez, de Henera.—Christ. 410 |
| 11 Alcivar, José.—Portrait of the Presbyter Manuel Justo Boliva. 410 | 33 Jimenes, Raphael.—Plans and mouldings for the Trescony of the chapel of Minerva. 410 |
| 12 Baltazar de Echave. | 34 Juarez, Luis.—Painting. 410 |
| <i>a</i> Purissima. 410 | 35 Juarez, J.—Adoration of Holy Kings. 410 |
| <i>b</i> At prayer in the Garden. 410 | 36 Jimenés, Jose.—Interior of the Court of Loretto. 410 |
| 13 Cabrera, Manuel. | 37 Manuel, Father.—The Jesuit. 410 |
| <i>a</i> Portrait, Virgin of the Apocalepsie. 410 | 38 Miguel, Mata y Reyes.—Water-Bearer. 410 |
| <i>b</i> Portrait St. Juna Tuez of the Cross. 410 | 39 Manchola, Juan.—St. Peter. 410 |
| 14 Correa, Juan.—St. Joseph with the Child Jesus. 410 | 40 Monroy, Petronile.—The Constitution. 410 |
| 15 Correa, Nicolas.—St. Catherine of Senna. 410 | |
| 16 Corral, Jesus.—Spanish Cottage. 410 | |
| 17 Clave, Pelegrin.—Donna Isabel of Portugal. 410 | |
| 18 Cordero, J.—Purissima. 410 | |
| 19 Coto, Luis.—Peasantry of Guadalupe. 410 | |
| 20 Calderon, José. | |
| <i>a</i> Entrance to the laboratory. 410 | |
| <i>b</i> Palace and cabinet of Senor Terreros. 410 | |

Paintings.

- | | |
|--|--|
| 41 Ma Valasquez, Jose.—Valley of Mexico. 410 | 55 Sebastian de Arteaga.—The Virgin. 410 |
| 42 Monroy, Luis.
a Death of Atala. 410
b The Orphans. 410 | 56 Saguedo, Ramon.—Castle of Emaus. 410 |
| 43 Mendoza, Francisco.—Painting. 410 | 57 Sanchez, Fiburcio.
a Family of the Senor Arce. 410
b Family of the Juan Urriche. 410 |
| 44 Ocaranza, Manuel.—The Drooping Flower. 410 | 58 Villalprando, Carlos.
a Interior of the Church of Bethlehem. 410
b St. Francis in Prayer. 410 |
| 45 Olegon, Jose.—Painting. 410 | 59 Vega, Ivaquin de la.—Portrait of Caream. 410 |
| 46 Paez, Jose.—St. Rosalia. 410 | 60 Vega, Fidencio de la.—Lucifer's Fall from Grace. 410 |
| 47 Pina, Salome.—St. Carlos. 410 | 61 Vasquez.—Ascension of the Holy Virgin. 410 |
| 48 Portu, Luis, Sir.—Portrait of Juarez. 410 | 62 Vargas, Atanacio.—The Prisoner. 410 |
| 49 Pavia, Felix.
a Brother Bartholomew de las Casas. 410
b Galileo. 410 | 63 Vallejo, Francisco.—Purissima, Most Holy. 410 |
| 50 Ruiz, Morlet, Juan Paricio.—St. Luis Gonzaga. 410 | 64 Vasquez, Mariane.—Portrait. 410 |
| 51 Rodriguez, Juan, St. John. 410 | 65 Vasquez, Ignacio.—David and Goliath. 410 |
| 52 Rodriguez, Nicolas.
a St. Gertrude. 410
b St. Thomas of Vallanueva. 410 | 66 Harran, Jose.—Sheets, with Passages in the Life of the Holy Virgin. 431 |
| 53 Ramirez, Augustin.—Noah's Ark and the Curate Hidalgo. 410 | |
| 54 Rebull, Santiago.—Death of Marat. 410 | |

BRAZIL.

Sculpture, Paintings, Photographs.

- | | |
|--|--|
| 1 Province of Rio Grande de Sul.—Cross of marble. 400 | 10 Carls, Henrique.—Lithographs. 424 |
| 2 Reis Almeida.—Plaster statue representing the late Bishop of Theresopolis. 400 | 11 N. N.—Various Lithographs. 424 |
| 3 Csta Silva.—Brazilian Arms. 405 | 12 Brazilian Geological Commission.—Photographs. 430 |
| 4 Americo, Pedro.—Brazilian army crossing Passo da Patria, led by Marshal Ozorio, during the Paraguay war. 410 | 13 Leuzinger.—Photographic Views. 430 |
| 5 Martino, De.—The Moonlight. 410 | 14 Mota, Agastinho da.—Views of Saquarema, Brazil. 430 |
| 6 Silveira, Sauza da.—Transparent miniatures. 411 | 15 N. N.—Photographs. 430 |
| 7 Almeida, M. J., d'.—Pen and ink drawings. 420 | 16 Sabino, Thomas.—Photographs. 430 |
| 8 Rocha, Antonio da.—Drawings with pen and ink. 420 | 17 The Colony of Itajaky.—Four Views of the Colony of Itajaky. 430 |
| 9 Bruteus, Jaynie.—Lithograph. 424 | 18 The Colony of Blumenau.—Views of the Colony of Blumenau. 430 |
| | 19 Pommerais, Leao.—Imitation woods and marbles. 442 |

ARGENTINE REPUBLIC.

Sculpture, Paintings, Photographs.

- 1 Romairone, Camilo, Province of Buenos Ayres.—A chalk bust of Dr. Sarsfield. 400
- 2 Solá, Ramon, Province of Entre-Rios. — Marble medallion representing Jesus and Mary, by Leon Solá. 400
- 3 Allio, José, Province of Córdoba.—
a A bust representing the Emperor Nerva. 401
b A bas-relief in transparent marble, The youth of the Saviour. 401
- 4 Beaugrand, N., Province of Buenos Ayres.—Medallions in bronze. 402
- 5 Pibernat, José.—Wood carving made by exhibitor at the age of 17. 405
- 6 Boneo, Martin L.
a The Wager of the Gaucho. 410
b The Gaucho in Love. 410
c The Gaucho Horse-breaker. 410
d The Gaucho en su pagu. 410
- 7 Charton, Ernesto.
a The Town and Port of Panamá. 410
b View of Guayaquil. 410
c Panorama view of the Port of Valparaiso. 410
d View of Santiago de Chili. 410
- 8 Charton, Ernesto.
a The Córdoba Promenade. 410
b Chilian Farmer. 410
- 9 Diaz, Josefa.—Oil paintings, representing—
a An Argentine Gaucho (peasant). 410
b Indigene of the Chaco. 410
c A Colored Servant. 410
d Fruits. 410
- 10 Del Castillo, Benjamin.
a The Burning of the Steamer "America" en route from Buenos Ayres to Montevideo. 410
b Peace. 410
c Fruits, etc. 410
- 11 Gattinoni, Carlos.
a Giovanni Boccaccio visiting Beatrice Alighieri, the daughter of Dante, in the Monastery of Ravennal. 410
b Rustic Yard. 410
c A Boy coming from the Bath. 410
d An Old Man's Head. 410
e A Difficult Answer. 410
- 12 Marroig, G. Juan, Province of Entre-Rios.—Oil paintings. 410
- 13 Muratori, José.
a Destruction of the Corsair "Alabama." 410
b Naval Battle of the Argentine Fleet. 410
d Episodes of the Corsair "La Argentina." 410
- 14 Pasquinelli, Anibal, Province de Santa Fé.—An oil painting executed in Rome. 410
- 15 Petrazzini, E., Province Buenos Ayres.
a Fruits. 410
b Glass Jar. 410
- 16 Alvarez, Guillermo, Province of Córdoba.—The Strait of San Roque (water color). 411
- 17 Anza, E. Rafael, Province of Entre-Rios.
a Studies on profiles. 420
b Studies on half faces. 420
c Studies on half faces, shaded. 420
d Bust of a child, in crayon. 420
e Foot of a Roman gladiator. 420
f Bust representing the Goddess of Talas. 420
- 18 The Commission.—42 Views of Córdoba. 421
- 19 The Commission, Province of Tucuman.—Views of Tucuman. 421
- 20 The Commission, Province of Santiago del Estero.—Views of Santiago del Estero. 421
- 21 Pozzo, Antonio, and the Preceptor of the School of Navarro.—An album of views of the campaign of Buenos Ayres. 421
- 22 Crecco, Juan.—Commemorative medals of the oath of the political constitution of the Province of Buenos Ayres. 422
- 23 Seillan, Luis.—Samples of medals in relief, carved plates, etc. 422
- 24 Schreiber & Co., Rosario, Province of Santa Fé.—Collection of lithographics. 423
- 25 Annals of Agriculture.—An album of photographic views of the agricultural exhibition of Buenos Ayres. 430
- 26 The Commission.—Photographic views of the city of Corrientes. 430
- 27 The Commission, Province of Salta.—Photograph of the place of Salta. 430
- 28 Lezcano, Flancisco, Province of Corrientes.—Photographs of the Indians of the mountains of the Province of Corrientes, called Yupi, Bugres or Coronados. 430
- 29 Monzon, Javier, Province of Buenos Ayres.—Collection of Photographs representing all the United States Presidents from Washington to Ulysses Grant. 430
- 30 Pozzo, Antonio.—Photographs of the Minister of War and other Argentine Officers. 430
- 31 Tappa, P., Province of Santa Fé.—Photographs made by the exhibitor. 430
- 32 Sellack, Dr. G., Province of Córdoba.—Photograph of the Moon, taken in the Argentine Astronomical Observatory. 430
- 33 Sandrot, José, Province of Buenos Ayres.—Mosaic plates made with marble of Buenos Ayres and Entre-Rios. Mosaic tiles. 451
- 34 The Commission, Province of Córdoba.—A small box carved in cocoanut wood. 452
- 35 Lacroix, Miguel.—A mosaic table representing the 14 Argentine provinces, with some of the principal buildings, types, costumes, etc. 452

Wood Carvings, Mosaics, etc.

- | | |
|--|--|
| <p>36 Musollino, Salvador.—Wood carved medallion. 452</p> <p>37 Molinari, Joaquin.—Medallions carved in wood. 452</p> <p>38 Marroig, Gabriel Juan, Province of Entre-Rios.—A wood-carved crucifix. 452</p> <p>39 Ribatto, Francisco.—A Mosaic table. 452</p> <p>40 Storn, N.
 <i>a</i> A mosaic inkstand made of native wood.
 <i>b</i> A column of mosaics. 452</p> | <p>41 Yedo, B.—Carved medallion. 452</p> <p>42 Colodrero, y Pedra Maria, Province of Corrientes.—A palm yatay worked with hair. 454</p> <p>43 The Commission, Province of San Luis.—A jewel box—cigar case made out of a lion's paws—cigar case of ostrich skin. 454</p> <p>44 Geiser, Federico.—Sun dial. 454</p> |
|--|--|

LOAN COLLECTION.

Sculpture, Paintings.

- | | |
|--|--|
| <p>1 Barcaglia, Milan, Italy.—The Soap Bubble. 400</p> <p>2 Guarnerio, Milan, Italy.
 <i>a</i> The Rose Bud. 400
 <i>b</i> The Forced Prayer. 400</p> <p>3 Sooryn Deb, God of the Sun, very ancient Hindoo sculpture, about two thousand years old. 400</p> <p>4 Ames, Joseph.
 <i>a</i> President Felton. 410
 <i>b</i> Daniel Webster. 410</p> <p>5 Armitage, E.—Resorge Chicago, 1871. 410</p> <p>6 Allston, W.—Rosalie. 410</p> <p>7 Allston, Washington.
 <i>a</i> Landscape. 410
 <i>b</i> Isaac of York. 410
 <i>c</i> Head of a Jew. 410</p> <p>8 Bagge, Magnus von, Berlin, Germany.—Moonrise over Lake Bygden, Norway. 410</p> <p>9 Brekelenkamp.—Painting. 410</p> <p>10 Boughton, Geo. A.—Going to Seek his Fortune. 410</p> <p>11 Della Valle, Carl Petro.—Shipwreck off the Coast near Leghorn. 410</p> <p>12 Cabanel, Alex., Paris.—Fransesci de Remeni. 410</p> <p>13 Chapman.—Harvest Scene on Roman Campagna. 410</p> <p>14 Copley.
 <i>a</i> Portrait of Samuel Ph. Savage. 410
 <i>b</i> Portrait of Mrs. Sarah Savage. 410</p> <p>15 Copley, J. Singleton.
 <i>a</i> John Adams. 410
 <i>b</i> Thomas Boylston. 410
 <i>c</i> Mrs. Thomas Boylston. 410</p> <p>16 Dunlap, Wm.—Portrait, Thomas Eddy. 410</p> <p>17 Dow, Gerard.—St. Peter in Prison. 410</p> <p>18 Duval, V., Paris.—The Salon of Apollo in the Louvre. 410</p> <p>19 Garret, R., Philadelphia, Pa.—Portrait. 410</p> | <p>20 Hondekoeter.—Dead Game. 410</p> <p>21 Hemsherk.—Cabaret. 410</p> <p>22 Helst, Vander.—Portrait of a Boy. 410</p> <p>23 Harding, J.—Portrait of Allston. 410</p> <p>24 Jtasse, Adolphe, Paris.
 <i>a</i> Christmas Wooden Shoe. 410
 <i>b</i> Birth of Love. 410
 <i>c</i> Day and Night. 410
 <i>d</i> L'amour au pantin. 410
 <i>e</i> John Crying and John Laughing. 410
 <i>f</i> Marble Busts. 410
 <i>g</i> Rest and Sorrows of the World. 410
 (Statuettes marble).</p> <p>25 Johnson, Eastman.
 <i>a</i> The old Stage-coach. 410
 <i>b</i> After the Feast. 410</p> <p>26 Lairesse, Gerard.—Portrait of infant Charles Edward Stuart (the young Pretender). 410</p> <p>27 Lely, Peter, Sir.—Portrait of George Fox. 410</p> <p>28 Leonardi da Vinci, attributed to.—Mona Lisa. 410</p> <p>29 Murillo.—St. Francis in his Cloister.
 <i>a</i> Wouverman, Philip.—War Scene. 410
 <i>b</i> Vernet, Joseph.—A Landscape. 410</p> <p>30 Murillo.—Holy Family.
 Poussin, N.—Bacchanalian Scene. 410</p> <p>31 Mayer, Constant.—Portrait. 410</p> <p>32 Makart, Hans, Vienna, Austria.
 <i>a</i> Abundance of the Sea. 410
 <i>b</i> Abundance of the Earth. 410</p> <p>33 McEntee, Jervis.—Autumn. 410</p> <p>34 Netscher, Gaspar.—Portrait of a lady. 410</p> <p>35 Neagle, John.—Gilbert Stuart. 410</p> <p>36 Ortman, Miss F. Auguste, Fontainebleau, France.—An Opening in the Forest of Fontainebleau. 410</p> <p>37 Pradez, Mrs. Vouga, Geneva, Switzerland.
 <i>a</i> Pictures of flowers. 410
 <i>b</i> Table of marble, (top painted in oil colors.) 410</p> |
|--|--|

Paintings, Miscellaneous Objects.

- | | |
|--|---|
| 38 Pohle, H., Düsseldorf, Germany.—
Landscape, burning castle. 410 | 54 Stuart, Gilbert.
a Fisher Ames. 410
b Judge Story. 410 |
| 39 Peale, Rembrandt, Philadelphia, Pa.
a Portrait of R. Peale. 410
b Portrait of Washington. 410 | 55 Stewart, J. L.
a Portrait of Miguel Zamacois. 410
b Portrait of Marie Elena Zamacois. 410 |
| 40 René, Guido.—Judith with Head of Holofernes. 410 | 56 Truman, Edward.—Gov. Thomas Hutchinson. 410 |
| 41 Robert, Leopold, Philadelphia, Pa.—Painting. 410 | 57 Titian—Venus.
Paolo, Veronese—The Family of Darius at the Feet of Alexander the Great. 410
Carletto, Calcarei—Marcus Curtius Leaping into the Gulf. 410
Gian, Carlo Aliberti—The Maternity of Venus and eight Cupids. 410
Jacopo, d'Empolè—Noah and Sons. 410
Bassano—Miracle of Moses. 410
Rembrandt—Head of a Rabbi. 410 |
| 42 Rembrandt, attributed to.
a An oil painting. 410
b A head. 410
c Head. 410
d An old man's head. 410 | 58 Unknown.—The Interior of St. Peter's Cathedral in Rome. 410 |
| 43 Richards, W. T.—The Wissahickon. 410 | 59 Unknown.—Portrait Peter Faneuil. 410 |
| 44 Rubens, P. P., attributed to.—Sussannah and the Elders. 410 | 60 Venius, Otho.—Fates. 410 |
| 45 Stewart, Gilbert.—Portrait Chief-Justice Jay 410 | 61 VanDyke.—Christ on the Cross. 410 |
| 46 Sarto, Andreo del.
a St. Peter's Call. 410
b Martyrdom of St. Andrew. 410 | 62 Vandael.—Flower piece painted for Josephine. 410 |
| 47 Schrader, Julius, Berlin, Germany.—Queen Elizabeth signing the death warrant of Mary Stuart. 410 | 63 Wertmuller.—George Washington, portrait from life, painted in Philadelphia, 1794. 410 |
| 48 Skirmunt, Simon de, Rome, Italy.
a Festival in Calonna Palace, Rome, in the XVI Century. 410
b Council of Ten in Venice. 410
c Reflection. 410 | 64 West, Benj.—Moses Striking the Rock. 410 |
| 49 Seitz, Otto, Munich, Bavaria.
a Nymph and Satyr. 410
b Neptune's Bridal Tour 410 | 65 Wilson, Rd.—Struck by Lightning. 410 |
| 50 Stone, W. O.
a Portrait Gov. King. 410
b Portrait Col. Munroe. 410 | 66 Wolf, Prof. Wilhelm, Berlin, Germany.—The Dying Lioness. 410 |
| 51 Smibet, John.—Bishop George Berkeley. 410 | 67 Weltmuller.—Portrait of Washington. 410 |
| 52 Schidonné.—Charité. 410 | 68 Weenix.—Dead Game. 410 |
| 53 Stuart, Gilbert.
a Mrs. Samuel Eliot. 410
b Mrs. John Gore. 410
c Bishop Chevenus. 410
d Mrs. Nath'l Coffin. 410 | 69 LeDuc, M. Viollet.—Archives of Historical monuments. 454 |
| | 70
a First daguerreotype taken in Pennsylvania. 454
b The first daguerreotype taken of the moon. 454 |

PHOTOGRAPHY.

PHOTOGRAPHIC EXHIBITION BUILDING. No. 4.

Architect, H. J. SCHWARZMANN.—Size, 242 feet by 77 feet

This building is located on the Avenue of the Republic, southeast of the Art Gallery. Its object is indicated by its name.

Photographs.

- | | |
|---|--|
| 1 Aitken, Wm., Philadelphia, Pa.
a Longfellow, (solar worked in crayon). 420
b Wendell Phillips (solar worked in crayon). 420
c Gen. Washington (solar worked in crayon). 420
d Pres. Lincoln (solar worked in crayon). | e Sec'y. Stanton (solar worked in crayon).
f Mrs. A. Stanton (solar worked in crayon). 420
g Emily A. Stanton (solar worked in crayon). 420
2 Anderson, D. H., Richmond, Va.—Photographs. 430 |
|---|--|

Photographs.

- 3 Allman & Co., New York, N. Y.—Photographs, views, plain portrait photographs, etc. 430
- 4 Alexander, A. G., Boston, Mass.—Photographs. 430
- 5 Black, J. W., Boston, Mass.—Photographs. 430
- 6 Baech, W., Boston, Mass.—Photographs. 430
- 7 Bachrach & Bro., Baltimore, Md.—Photographs. 430
- 8 Berkan, O., Philadelphia, Pa.—Pyro-photography. 430
- 9 Bigelow, L. G., Detroit, Mich.—Photograph. 430
- 10 Busey, N. S., Baltimore, Md.—Photographs. 430
- 11 Bradley & Ruloffson, San Francisco, Cal.—Photograph. 430
- 12 Bressan, Giovanni, Philadelphia, Pa.—Photographs finished in crayon. 430
- 13 Burrell, D. T., Brockton, Mass.—Chart showing effect of color in photography. 430
- 14 Braich, H., & Co., Milwaukee, Wis.—Photograph portraits. 430
- 15 Broadbent & Phillips, Philadelphia, Pa.—Photographs, crayons and india ink. 430
- 16 Bierstadt, C., Niagara Falls, N. Y.—Stereographs. 430
- 17 Boettcher, Edw., Jersey City, N. J.—Photographic portraits. 430
- 18 Bendann, Daniel, Baltimore, Md.—Photographs. 430
- 19 Bolles, M., Boston, Mass.—Photographs. 430
- 20 Butterfield, D. W., Boston, Mass.—Landscape photographs. 430
- 21 Burnham, T. R., Boston, Mass.—Photographs. 430
- 22 Berkan, O., Philadelphia, Pa.—Photographs on glass, porcelain, etc. 430
- 23 Capen, M. L. B., Boston, Mass.—Photographs. 430
- 24 Carvalljo, D. H., New York, N. Y.—Process of photo-engraving photographs. 430
- 25 Collins, G. W., Urbana, Ohio.—Photographs. 430
- 26 Centennial Photograph Co., Philadelphia, Pa.—Photographs. 430
- 27 Chase, W. M., Baltimore, Md.—Landscape photographs. 430
- 28 Clayton, W. D., Philadelphia, Pa.—Photographs. 430
- 29 Clark, W. L., Boston, Mass.—Photographs. 430
- 30 Chillman, P. E., & Co., Philadelphia, Pa.—Photographs. 430
- 31 Crider & Bro., York, Pa.—Photographs of certificates, etc. 430
- 32 Copelin & Son, Chicago, Ill.—Photographic views of churches, etc. 430
- 33 Clinton, J. J., Philadelphia, Pa.—Photographs. 430
- 34 Dunham, Mrs. F. S., Monticello, Iowa.—Photographs. 430
- 35 Dotterer, Rev. A. F., Holmesburg, Pa.—Photographs from the East. 430
- 36 Delan, S. J., Philadelphia, Pa.—Photographs. 430
- 37 Doremus, J. P., Paterson, N. J.—Photographs. 430
- 38 Delamantu, R. S., Hartford, Conn.—Photographs. 430
- 39 Delevan, C. H., New York, N. Y.—Photograph of Delevan monument. 430
- 40 DeSilva, A., New Haven, Conn.—Photographs. 430
- 41 Evans, E. D., Corning, N. Y.—Photographs. 430
- 42 Folsom, J. H., Danville, Conn.
 - a Photographs. 430
 - b Solar prints, etc. 430
- 43 French, J. A., Keene, N. H.—Frame of stereoscopic views. 430
- 44 Fisher, C. P., Philadelphia, Pa.
 - a Photographs. 430
 - b Centennial Portrait Gallery. 430
- 45 Frederick, C. D., & Co., New York, N. Y.—Photographs. 430
- 46 Freeman, A., Dallas, Texas.—Photographs. 430
- 47 Graves, J. A., Water Gap, Pa.—Photographic views of mountain and river scenery and waterfalls. 430
- 48 Guebelman, Theo., Jersey City, N. J.—Photographic portraits. 430
- 49 Gutekunst, F., Philadelphia, Pa.—Photographs. 430
- 50 Gutekunst, Fred., Philadelphia, Pa.—Photographs in various styles. 430
- 51 Gerlach & Fromhagen, Philadelphia, Pa.—Photographs. 430
- 52 Geutill, C., Chicago, Ill.—Photocrayon and photographs. 430
- 53 Good, Frank M., London, England.—Photographs of Palestine. 430
- 54 Grant, A. G., Jacksonville, Fla.
 - a Photographs of Florida. 430
 - b Magic-lantern slides. 430
 - c Irish views. 430
- 55 Goldsmith, J. H., New York, N. Y.—Photographs. 430
- 56 Granges, Baron Paul des, Florence, Italy.—Archæological photos. 430
- 57 Hand, A. N., Boston, Mass.—Photographs. 430
- 58 Harding, I. E., Curran, Mo.—Photographs. 430
- 59 Haring, J. C., Massillon, Ohio.—Photographs. 430
- 60 Holber, Henry, Brooklyn, N. Y.—Photographs. 430
- 61 Hesler, A., Evanstown, Ill.—Framed photographs. 430
- 62 Hall, Julius, Great Barrington, Mass.—Stereoscopic views and photographs. 430
- 63 Hart, E. H., Philadelphia, Pa.—Photographs. 430
- 64 Hovey, E. Y., Philadelphia, Pa.—Heliographs and photographs. 430
- 65 Howell, J. R., New York, N. Y.—Photograph colored, etc. 430
- 66 Illingworth, W. H., St. Paul, Minn.—Stereographs of Minnesota, Black Hills and Lake Superior. 430
- 67 Jenger, H., Paterson, N. J.—Photographs, plain and painted. 430

Photographs.

- 68 Kurtz, W., New York, N. Y.—Artistic photography. 430
- 69 Kihlholz, B., Chicago, Ill.—Photographs. 430
- 70 Kilburn, B. W., Littleton, N. H.—Landscape photographs. 430
- 71 Kew, J. H., Rochester, N. Y.—Photographs. 430
- 72 Levy, A., New York, N. Y.—Architectural Photographs. 430
- 73 Lawton, L. W., San Francisco, Cal.—Photographs. 430
- 74 Landy, James, Cincinnati, Ohio.—Photographs. 430
- 75 Lamson, J. H., Portland, Me.—Photographs. 430
- 76 Lewis, Thomas, Cambridgeport, Mass.—Stereographs of historic scenes. 430
- 77 Levy & Co., J., Paris, France.—Glass Transparent photographs. 430
- 78 Marshall, A., Boston, Mass.—Photographs. 430
- 79 Mosher, C. D., Chicago, Ill.—Photographs.—Crayons, water colors. 430
- 80 Meyer, James, New York, N. Y.—Photographs. 430
- 81 Myers, Alex., Philadelphia, Pa.—Photographs of fifty homeopathic physicians. 430
- 82 Mosher, C. S., Baltimore, Md.—Photographs. 430
- 83 Mason, O. G., New York, N. Y.—Photographs of the Moon and Solar Spectrum. 430
- 84 McIntyre, A. C., & Co., Alexandria Bay, N. Y.—Photographs of the Thousand Islands. 430
- 85 McCormick, J. L., Boston, Mass.—Photographs. 430
- 86 Mayo, T. H., Chelsea, Mass.—Photographic views in Florida. 430
- 87 Mora, J. M., New York, N. Y.—Photographs and drawings. 430
- 88 Newell, R., & Son, Philadelphia, Pa.—Photographs. 430
- 89 Newton, H. D., New York, N. Y.—Photographic prints. 430
- 90 Newman, A., Philadelphia, Pa. 430
- 91 Okerland, E. G., Ishpeming, Mich.—Photographs. 430
- 92 O'Hara, D., Philadelphia, Pa.—Photographs. 430
- 93 Portland Co., Portland, Maine.—Photographs of engines. 430
- 94 Pollock, Chas., Boston, Mass.—Stereographs. 430
- 95 Paxon, C., & Son, New York, N. Y.—Photographs. 430
- 96 Pach, G. W., New York, N. Y.—Photographs. 430
- 97 Paullin, W. F., Philadelphia, Pa.—Photographs. 430
- 98 Pearsall, G. F. E., Brooklyn, N. Y.—Photographs. 430
- 99 Robbins, F., Oil City, Pa.—Photographic views of the Oil Regions in Pennsylvania. 430
- 100 Root, Marcus A., Philadelphia, Pa.—Specimens illustrating the progress of Photography, from August, 1839 to April, 1876. 430
- 101 Reed, John, Paterson, N. J.—Photographs. 430
- 102 Reau, Geger, Philadelphia, Pa.—Photographs. 430
- 103 Ryder, J. F., Cleveland, Ohio.—Photographs. 430
- 104 Reimer, B. F., Philadelphia, Pa.—Photographs. 430
- 105 Rice Bros., Washington, D. C.—Photographs. 430
- 106 Randall, C., Detroit, Mich.—Photographs and Crayons. 430
- 107 Relvas, Carlos, Collega, Portugal.—Photographs. 430
- 108 Reilly, J. J., San Francisco, Cal.—Stereographs. 430
- 109 Robinson, H. P., Tunbridge Wells, England.—Composition photographs. 430
- 110 Seavey, L. F. W., New York, N. Y.—Photographic views. 430
- 111 Spahn, E. P., Newark, N. J.—Photographic groups. 430
- 112 Sweeney, T. T., Cleveland, Ohio.—Stereographs and landscape photographs. 430
- 113 Saunders, Irving, Alfred Centre, Pa.—Framed photographs. 430
- 114 Schlesinger, Leopold, Philadelphia.—Gallery of physicians and Medical Institutions of Philadelphia. 430
- 115 Schwind & Krueger, New York, N. Y.—Photographs. 430
- 116 Schreiber & Sons, Philadelphia, Pa.—Photographs of animals. 430
- 117 Stillfried & Anderson, Yokohama, Japan.—Genre photos. 430
- 118 Schluter, B., Kansas City, Mo.
a Solar in India ink. 430
b Solar in Crayon. 430
c Solar in Pastills. 430
- 119 Solomon, Israel, Philadelphia, Pa.—Photographs. 430
- 120 Seiler, C., Dr., Philadelphia, Pa.—Micro-photographs. 430
- 121 Stoddard, S. R., Glens Falls, N. Y.
a Photographs. 430
b Photographic book. 430
- 122 Sarony, N., New York, N. Y.—Artistic photography. 430
- 123 Turner, J. W., Boston, Mass.—Photographs. 430
- 124 Taylor, Wm. Curtis, Philadelphia, Pa.—Photographs. 430
- 125 Timon, M. P., Philadelphia, Pa.—Photographs. 430
- 126 Tyson, Isaac G., Philadelphia, Pa.—Photographs. 430
- 127 Train, H. E., Helena, Montana Ty.—Photographs. 430
- 128 Thorne, Geo. W., New York, N. Y.—Photographs of American scenery. 430
- 129 Van Loo, Geo., Cincinnati, Ohio.—Photographs. 430
- 130 Vance, R. H., San Francisco, Cal.—Photographic portrait. 430
- 131 Weston, N., San Francisco, Cal.—Photographs. 430
- 132 Waterman & Hall, New York, N. Y.—Photographs of landscapes and buildings. 430

Photographs, Apparatus, Supplies, etc.

- 133 Waller & Schrader, Brooklyn, N. Y.—Photographs. 430
- 134 Wood, R. E., Santa Cruz, Cal.—Lantern views. 430
- 135 Watkins, C. E., San Francisco, Cal.—Landscape photographs. 430
- 136 Warren, G. K., Boston, Mass.—Photographs framed and in show cases. 430
- 137 Wilt Bros., Franklin, Pa.—Photograph oil views. 430
- 138 Waldhaw, Jos., Philadelphia, Pa.—Photographs. 430
- 139 Weaver, A. K., Salem, Ohio.—Photograph ferns. 430
- 140 Zimmerman, C. A., St. Paul, Minn.—Photographs. 430
- 141 Allen & Romell, Boston, Mass.—Photographs in carbon. 431
- 142 Bierstadt, Edward, New York.—Photographs in printing-ink by the Albertype process. 431
- 143 Bierstadt, E., New York, N. Y.—Albertypes or photographs in printing-ink. 431
- 144 Braun, Adolphe, a Dornach, Ht. Rhin, France.—Photographic and heliographic work. 431
- 145 Bonine, E. A., Emporium, Pa.—Stereographs, views in Florida. 431
- 146 Hirsh, J. M., Chicago, Ill.—Phototype, photo-engraving, photo-lithography, chemical sculpture. 431
- 147 Jones, Alfred, New York, N. Y.—Framed examples of photo-mechanical engraving. 431
- 148 Osgood, J. R., & Co., Boston, Mass.—Collections of heliotypes. 433
- 149 Ornamental Mirror Co., New York, N. Y.—Photo-relievos. 431
- 150 Wendroth, F. R., Philadelphia, Pa.
 a Photographs. 431
 b Photo-zincographs. 431
 c Photo-electrotypes. 431
- 151 Wallace, E., Philadelphia, Pa.—Photographic landscapes. 431
- 152 American Photo-lithographic Co., New York, N. Y.—Photo-lithograph of ten drawings, etc. 432
- 153 Alber, M. H., Marlboro, Mass.—Photographic case. 433
- 154 Adams, W. Irving, Montclair, N. J.—Photographers' materials. 433
- 155 Anthony, E. & H. T., New York, N. Y.—Photographs and photograph apparatus. 433
- 156 Allen, W. H., & Bro., Detroit, Mich.—One ornamental picture-frame. 433
- 157 Bachrach & Bro., Baltimore, Md.—Photographic apparatus. 433
- 158 Bass, J. P., Bangor, Maine.—Photograph burnishers. 433
- 159 Benerman & Wilson, Philadelphia, Pa.
 a Photographic publications. 433
 b Photographic appliances. 433
- 160 Beckers, Alex., Broadway, N. Y.—Revolving graphoscope and stereoscopes. 433
- 161 Collins, A. M., Son & Co., Philadelphia, Pa.—Photographic materials. 433
- 162 Cremer, James, Philadelphia, Pa.—Improved graphoscopes and stereoscopes. 433
- 163 Dunham, Mrs. S. F., Monticello, Iowa.—Stereoscopes. 433
- 164 Evans, G. & W. P., Malden, Mass.—Photographic apparatus. 433
- 165 Gutekin, W. G., Manayunk, Pa.—Photographic burnishers. 433
- 166 Harris, Warren, Danville, Vt.—Photographic apparatus. 433
- 167 Hance, Alfred L., Philadelphia, Pa.—Photographic preparations. 433
- 168 Haworth, John, Philadelphia, Pa.—Photographic apparatus. 433
- 169 Hutinet, J. D., Paris, France.—Photographic mounts. 433
- 170 Hearn, C. W., Philadelphia, Pa.—Photographic paper. 433
- 171 Marcy, L. G., Philadelphia, Pa.—Stereoptician. 433
- 172 McCollin, Thos. H., Philadelphia, Pa.—Photographic apparatus. 433
- 173 Muraaur, Fleury, New York, N. Y.—A machine for re-touching negatives. 433
- 174 Newell, R., & Son, Philadelphia, Pa.—Photographic apparatus. 433
- 175 Nason Novelty Co., Columbus, Ohio.—Non-ague camera stand. 433
- 176 Peck, Samuel, & Co., New Haven, Conn.—Photographic apparatus. 433
- 177 Pattberg, Lewis, & Bros., New York, N. Y.—Fancy metal and velvet frames. 433
- 178 Rice, J. D., Philadelphia, Pa.—Stereoscopic picture-holder. 433
- 179 Rocher, H., Chicago, Ill.—Photographic frames. 433
- 180 Seavey, L. F. W., New York.—Photographic apparatus. 433
- 181 Spahn, E. P., Newark, N. J.—Photographic camera and machinery. 433
- 182 Sibley, S. D., & Co., Vineland, Cumberland Co., N. J.—Photographic apparatus. 433
- 183 Semmendinger, August, Fort Lee, N. J.—Photographic apparatus. 433
- 184 Scovill Manufacturing Co., New York, N. Y.—Photographic apparatus. 433
- 185 Stock, John, & Bro., New York, N. Y.—Photographic camera. 433
- 186 Therenni, F., Cleveland, Ohio.—Re-touching machine. 433
- 187 Turner, J. W., Boston, Mass.—Photographic apparatus. 433
- 188 Volkmar, C., Sr., Baltimore, Md.—Automatic megaloscope and sola camera. 433
- 189 White, H. C., North Bennington, Vermont.—Photographic apparatus. 433
- 190 Wilson, J. J., New York, N. Y.—Stereoptician. 433
- 191 Wilson, Hood & Co., Philadelphia, Pa.—Photographic apparatus. 433
- 192 Woodward, D. A., Baltimore, Md.—Photo apparatus. 433
- 193 Walls, William, Fort Lee, N. J.—Microscopic object-glasses and microphotographs. 433
- 194 Wilson, J. J., New York, N. Y.—Magic lantern and stereoptician. 433

INDEX OF EXHIBITORS.

DEPARTMENT IV.

- Accaristi, L., Painting, 50.
Accard, E., Painting, 35.
Adams, Miss, Paintings, 16.
Adams, W. I., Photographs, 58.
Adan, L. E., Painting, 35.
Adeline, J., Paintings, 40.
Adelskåld, C., Painting, 46.
Ahrenberg, J., Painting, 48.
Aitken, W., Crayon drawing, 55.
Albert, Louis, Paintings, Photographs, 58.
Albert, N. H., Photographs, 58.
Albert, J., Photographs, 43.
Alcivar, J., Painting, 51.
Alexander, Fanny, Paintings, 16.
Alexander, Francis, Painting, 15.
Alexander, A. G., Photographs, 56.
Allebe, A., Painting, 43.
Allemand, G., Painting, 35.
Allen & Romell, Photographs, 58.
Allen, W. H., & Bro., Photographs, 58.
Allio, Jose, Sculpture, 53.
Allman & Co., Photographs, 56.
Allston, W., Painting, 54.
Almeida, M. J. d', Engravings, 52.
Altmann, S., Painting, 43.
Alvarez, Guillermo, Painting, 53.
Americo, Pedro, Painting, 52.
American Photo-lithographic Co., Phot'gs, 58.
American Photo-relief Printing, 27.
American Bank Note Co., Engravings, 29.
American Enamel Decorating Co., Decorations, 28.
Ames, Jos., Painting, 54.
Andersen, A., Paintings, 46.
Anderson, W., Photographs, 33.
Anderson, A. A., Paintings, 16.
Anderson, D. A., Photographs, 55.
Andrews, J., Engraving, 27.
Andrews, E. F., Painting, 16.
Andrieux, J. H., Painting, 39.
Ankarkrona, H., Painting, 46.
Anker, H., Painting, 48.
Annals of Agriculture, Photographs, 53.
Antigna, Y. P. A., Painting, 35.
Anthony, E. & H. T., Photographs, 58.
Antonio, J., Painting, 51.
Anza, E. R., Photographs, 53.
Apol, L., Painting, 43.
Appert, E., Photographs, 41.
Arbo, P. N., Painting, 48.
Arborelius, O. P., Painting, 46.
Armitage, E., Painting, 54.
Armstrong, D. M., Painting, 15.
Arnold, Miss C. H., Painting, 15.
Arnold, Mrs. E. P., Painting, 16.
Arson, A., Sculpture, 34.
Askevold, A., Painting, 48.
Aubert, E. E., Photographs, 49.
Aubry, Lithographs, 41.
Audobon, J. J., Painting, 16.
Antiqua, J. P., Painting, 35.
Baade, K., Painting, 49.
Baccetti, A., Sculpture, 50.
Bache, O., Painting, 46.
Bachrach & Bro., Photographs, 56, 58.
Bacon, H., Painting, 16.
Balch, J. W., Photograph, 56.
Bagge, A. von, Painting, 54.
Baker, J., & Son, Glass, 31.
Baker, Miss M. K., Painting, 16.
Baker, Painting, 16.
Baldwin, A. A., Painting, 16.
Baldwin, A. H., Painting, 25.
Ball, J. S., Vases, etc., 32.
Ballavoine, J. F., Painting, 36.
Ballot, Mrs. A., Painting, 35.
Ballue, A., Engraving, 40.
Baltazar, de, Echave, 51.
Bannister, E. M., Painting, 16.
Bar, P. A., Painting, 39.
Bar, P. A. de, Painting, 35.
Barber, W., Medals, 28.
Barbetti, R., Sculpture, 50.
Barcaglia, Sculpture, 54.
Baron, S., Painting, 36.
Barrell, A. T., Paintings, 33.
Barelli, P., Engraving, 50.
Barlow, J. H., 32.
Barrias, F. J., Painting, 36.
Barrias, E. L., Sculpture, 34.
Bartholdi, F. A., Sculpture, 34; Painting, 35.
Bartlet, G. H., Paintings, 16.
Bartlett, G. H., Drawings, 27.
Bary, Pahl, & Cafrade, Designs, 31.
Bass, J. P., Photographs, 58.
Bateman, H., Engraving, 30.
Batten, Downing, & Co., 32.
Bauer, Sculpture, 45.
Baumgarten, J., Medals, 28, 29.
Bavarian Technological Museum, Sculpture, 42.
Bavier, F., Sculpture, 15.
Baxhuysen, Mrs. G. J. van de S., Painting, 45.
Bazzanti, S., & Bros., Mosaics, 50; Sculpture, 50.
Beard, J. H., Paintings, 16.
Beard, W. H., Painting, 16.
Beauchard, Miss A., Painting, 39.
Beaucé, J. A., Painting, 36.
Beaugrand, N., Sculpture, 53.
Beccuci, L. & R., Sculpture, 50.
Becker, G., Painting, 36.
Becker, G. S., Drawings, 29.
Beckers, A., Photographs, 58.
Beckwith, A. G., Engravings, 33.
Beckwith, A., Tiles, 31.
Bedeau, P., Designs, 31.
Beeson, E. L., Painting, 16.
Beeler, J. C., Decorations, 31.
Béliard, E., Painting, 35.
Bell, J. W., Painting, 16.
Bellangé, E., Painting, 35.
Bellée, L. G., Painting, 36.
Belle, J. J., Paintings, 35; Water color, 39.
Bellezza, N. A., Sculpture, 50.
Bellows, A. F., Paintings, 25.
Bendann, D., Photographs, 56.
Bengson, E., Painting.

- Benham, J. N., jr., 32.
 Benerman & Wilson, Photographs, 58.
 Bennett, G., Sculpture, 33.
 Bennetter, J. J., Painting, 49.
 Benouville, A., Painting, 36.
 Benson, E., Paintings, 16.
 Bensell, E. B., Drawings, 29.
 Benton, D., Painting, 16.
 Benton, J. D., Model, 31.
 Berchère, N., Painting, 36.
 Berg, A., Painting, 47.
 Berg, E., Painting, 46.
 Berg, O., Sculpture, 46.
 Bergh, A., Painting, 48.
 Bergman, Miss E., Painting, 46.
 Bergstedt, Miss A., Painting, 46.
 Berkan, F. G., Photographs, 56.
 Bernond, A., Photographs, 41.
 Bernard, Mrs. D., Painting, 39.
 Berteaux, Mrs. L., Sculpture, 34.
 Berthélemy, P. E., Painting, 35.
 Bertrand, E., Painting, 33.
 Betti, F., Mosaics, 50.
 Bevington, S., Painting, 28.
 Bevis, M., Decorations, 34.
 Beyseno & Beckers, Painting, 39.
 Bianchini, T., Mosaics, 50.
 Bidau, E., Painting, 35.
 Bien, J., Engravings, 29.
 Bierstadt, A., Painting, 16.
 Bierstadt, C., Photographs, 56.
 Bierstadt, E., Photographs, 58.
 Bigelow, D. F., Painting, 16.
 Bigelow, L. G., Photographs, 56.
 Bilders, J. W., Painting, 43.
 Billing, T., Painting, 46.
 Billings, E. T., Paintings, 16.
 Binling, G., Painting, 25.
 Birch, T., Painting, 16.
 Bishop, G., & Co., Lithographs, 33; Engravings, 33.
 Bispham, H. C., Painting, 16.
 Bisschop, C., Painting, 43.
 Black, J. W., Photographs, 56.
 Blackfield, E. H., Painting, 56.
 Blackstadius, J. L., Painting, 48.
 Blackwell, Miss S. E., Painting, 16.
 Blanc, C. J., Painting, 35.
 Blanchard, J., Sculpture, 34.
 Blashfield, E. H., Painting, 16.
 Bliss, Mrs. L. S., Painting, 25.
 Blois, F. B. de, Painting, 16.
 Blot, E., Sculpture, 34.
 Blum, M., Painting, 35.
 Boe, F., Painting, 48.
 Boehme & Frankel, Oil Prints, 42.
 Boettcher, E., Photographs, 56.
 Bognard, J., jr., Lithographs, 41.
 Boklund, J. Ch., Painting, 46.
 Boks, M., Painting, 43.
 Bolden, R. H., Engravings, 30.
 Bolles, M., Photographs, 56.
 Boncinelli, G., & Sons, Mosaics, 50.
 Boneo, Martin L., Paintings, 53.
 Bonfield, V. de V., Painting, 16.
 Boni, A., Sculpture, 50.
 Bonine, E. A., Photographs, 58.
 Bonnefoy, H., Painting, 36.
 Boott, E., Painting, 16.
 Borch, C., Sculpture, 49.
 Borselen, J. W. van, Painting, 43.
 Bosboom, J., Painting, 43.
 Boschetti, B., Sculpture, 50.
 Boston Society of Architects, Designs, 31.
 Bouasse-Lebel (fils aîné), Eng. and lith., 41.
 Bouchard, J., Decorations, 34.
 Boucherat, C., Industrial designs, 42.
 Boughton, G. H., Painting, 16; Water color, 25.
 Boughton, G. A., Painting, 54.
 Boulenger-aîné, Mosaics, 42.
 Bourgerie, Villette A., Lithographs, 41.
 Börjeson, J., Sculpture, 46.
 Brackett, W. M., Painting, 16.
 Bradley & Ruloffson, Photographs, 56.
 Brandes & Wolff, Oil prints, 42.
 Brandelius, P., Painting, 46.
 Braich, H., & Co., Photographs, 56.
 Brainerd, Mrs. M. N., Painting, 16.
 Braun, A., Photographs, 43; Drawing, 58.
 Bray, J. de, Photographs, 41.
 Brazilian Geological Commission, Photo., 52.
 Brekelenkamp, Painting, 54.
 Brenner, C. C., Painting, 16.
 Breton, E., Painting, 35.
 Bretchman, E., Sculpture, 15.
 Bressler & Kressler, Engraving, 30.
 Bressan, G., 27, 55.
 Brest, F., Painting, 35.
 Brett, W. H., & Co., Engravings, 29.
 Bricher, A. I., Painting, 25.
 Bridges, Miss F., Painting, 25.
 Bridgman, C. J., Painting, 16.
 Bridgeman, F. A., Painting, 16.
 Briscoe, F. D., Painting, 16.
 Bristol, J. B., Painting, 16.
 Brissot de Varville, F. S., Painting, 35.
 B. A. Bank Note Co., Engravings, 33.
 Broadbent & Phillips, Photographs, 56.
 Brocard, P. J., Mosaic, etc., 42.
 Brogi, F., & Co., Sculpture, 50.
 Brooks, John, Marble bible, 32.
 Brooks, A. F., Painting, 16.
 Brooks, I., Painting, 16.
 Brown, C. V., Painting, 16.
 Brown, G. L., Painting, 16; Etching, 16.
 Brown, H. B., Painting, 16.
 Brown, W., Water color, 25.
 Brown, G. S., Water color, 25.
 Brown, J. G., Paintings, 25.
 Brown, W. W., Painting, 16.
 Brown, J. H., Water color, 25.
 Bruce, J., & Co., Photographs, 33.
 Brucken, A. F., Paintings, 16.
 Brucken, A. F., Water color, 25.
 Bruecke, G., Painting, 16.
 Brueille, G., Painting, 36.
 Brukner & Co., Chromo-lithographs, 42.
 Brunacci, P. F., Mosaics, 50.
 Brunn, G. L., Water color, 25.
 Brum, G. S., Drawings, 27.
 Brunet, Debaines A., Engraving, 40.
 Brunet, P., Model, 42.
 Brunet, Howard P. A., Painting, 35.
 Bruss, G. de F., Painting, 16.
 Bruteus, J., Lithographs, 52.
 Brüll, D., Painting, 16.
 Buhot, F. H., Engraving, 40.
 Bunner, A. F., Painting, 16.
 Burdick, H. R., Painting, 25.
 Bureau, E., Card receiver, 32.
 Burling, G., Painting, 25.
 Burne, Miss M., Paintings, 33.
 Burnes, C. M., Painting, 16.
 Burnham, T. R., Photographs, 56.
 Burrow, R. W., Photographs, 33.
 Burrell, D. T., Photographs, 56.
 Burt, M., Painting, 16; Drawing, 27.
 Burton, W. J., Painting, 16.
 Busey, N. S., Photographs, 56.
 Busson, C., Painting, 36.
 Butterfield, D. W., Photographs, 56.
 Cabaillet-Lassalle, C., Painting, 36.
 Cabanel, A., Painting, 54.
 Cabot, E. C., Paintings, 17.
 Cabrera, M., Painting, 51.
 Cabuzel, A. H., Painting, 36.
 Caillier, C., Industrial Designs, 42.
 Caillé, J. M., Sculpture, 34.
 Cain, A., Sculpture, 34.
 Calderon, J., Painting, 51.
 Caldwell, S., 32.
 Callias, H. de, Painting, 36.
 Calvo, Sculpture, 51.
 Cambos, J., Sculpture, 34.
 Cameron, Miss K., Painting, 17.
 Camp, J. H., Lithographs, 30, 27.
 Canedi, E. G., Architecture, 50.

- Canta, J. A., Painting, 43.
 Cantzler, H., Painting, 47.
 Capannini, C., Sculpture, 50.
 Capen, M. L. B., Photographs, 56.
 Carrara, P. B., Sculpture, 50.
 Carbutt, J., Lithographs, 27.
 Cardier, C., Painting.
 Cardan, J., Lithographs, 48.
 Cardozo, T. de, Painting, 17.
 Cariss, H. T., Painting.
 Carleman, C. G. W., Photographs, 48.
 Carlin, J., Painting, 17.
 Carpenter, D. H., Drawings, 29.
 Carrier-Belleuse, P., Painting, 36.
 Carson, Mrs. C., Painting, 25; Miscellaneous, 28.
 Carstens, B. A., Photographs, 49.
 Cartufi, L., Architecture, 50.
 Cartisser, J., Embossed glass, 32.
 Carvalljo, D. H., Photographs, 56.
 Casilear, J. W., Painting, 17.
 Cassagne, A., Painting, 36.
 Cassagne, A. T., Drawings, 39.
 Cassarin, A., Painting, 51.
 Cassett, W., Sculpture, 15.
 Cassinelli, H. L., Painting, 36.
 Castelnau, P. de, Painting, 36.
 Castiglione, J., Painting, 36.
 Catlin, G., Painting, 17.
 Caverly, C., Sculpture, 15.
 Cecchi, C. V., Sculpture, 50.
 Cecioni, Sculpture, 34.
 Cedergren, P. N., Painting, 47.
 Cederström, G., Baron, Painting, 47.
 Central Aryckeriets Aktibolag, Lithographs, 48.
 Centennial Chromo Co., 30.
 Centennial Photograph Co., 56.
 Ceriani, G., Sculpture, 50.
 Cetner, A. A. de, Painting, 36.
 Civita, A., Mosaics, 31.
 Clairval, Miss M., Painting, 36.
 Clark, W. L., Photographs, 56.
 Clark, Ch. H., Chair, 32.
 Clayton, W. L., Photographs, 56.
 Clement, F. A., Painting, 36.
 Clinton, J. J., Photographs, 56.
 Clowes, C. M., Painting, 17.
 Chabin, H., Painting, 39.
 Chagot, E., Painting, 39.
 Chaillon, N., Painting, 36.
 Chamber of Commerce of Sienna, Sculpture, 50.
 Champney, J. W., Paintings, 17.
 Champney, B., Paintings, 17.
 Chan, W. M., Painting, 17.
 Chapman, Painting, 54.
 Chargot, E., Painting, 36.
 Chartran, T., Painting, 36.
 Charton, Erneste, Paintings, 53.
 Chase, F. R., Painting, 17.
 Chase, W. L., Photograph, 56.
 Chatrousse, E., Sculpture, 34.
 Chiari, P. A., Drawings, 50.
 Christensen, C. C. A., Painting, 16.
 Christofle & Co., Models, 42.
 Chéret, L., Painting, 36.
 Chevalier, Lithographs, 41.
 Chevrier, J., Painting, 36.
 Chiapparelli, T., Sculpture, 50.
 Chillman, P. E., & Co., Photographs, 56.
 Clave, P., Painting, 52.
 Cliver & Elway, Mosaics, 31.
 Clino, S. J., Photographs, 33.
 Cobb, D., Painting, 17.
 Codezo, T. de, Painting, 26.
 Cohn, L. H., & Co., 30.
 Cohen, T. T., Drawing, 29.
 Coindre, G. J., Engraving, 40.
 Cole, J. F., Paintings, 17.
 Cole, T., Painting, 17.
 Collette, A., Painting, 36.
 Collins, M. G., Perfumers, 30.
 Collins, G. W., Photographs, 56.
 Collins, A. M., Son, & Co., Photographs, 58.
 Collyer, V., Paintings, 17.
 Colman, S., Water colors, 25.
 Colman, Samuel, Painting, 17.
 Colodrero, P. M., Miscellaneous, 54.
 Colony of Blumenau, Photographs, 52.
 Comerre, L., Painting, 36.
 Commissioners Illinois State Penitentiary, Drawings, 31.
 Comte, P. C., Painting, 36.
 Condit, I., Water color, 28.
 Continental Bank Note Co., Engravings, 29.
 Convent of Good Shepherd, Paintings, 33.
 Convent, Sillery, Picture work, 34.
 Cooper, E., Sculpture, 15.
 Cooper Union School, Drawings, 29; Pho's, 30.
 Coply, Paintings, 54.
 Copelin & Son, Photographs, 56.
 Cordero, J., Painting, 51.
 Cordoba, Province of, Sculpture, 53.
 Cordier, C., Sculpture, 34, 35.
 Corkill, E., Imitation marble, 32.
 Cornu, E., & Co., Models, 42.
 Coroënné, H., Painting, 36.
 Corral, J., Painting, 51.
 Correa, J., Painting, 51.
 Correa, N., Painting, 51.
 Cortelyou, G. V., Painting, 26.
 Cortez, V., Painting, 39.
 Cossmann, M., Painting, 36.
 Costa-Silva, Sculpture, 52.
 Cote, J. B., Sculpture, 33.
 Coto, L., Painting, 51.
 Couder, E. G., Painting, 36.
 Courop, Mrs., Painting, 17.
 Courdouan, V., Paintings, 36, 39.
 Courtoismon, Miss B., Painting, 39.
 Cox, W. B., Painting, 29.
 Craeyvanger, R., Painting, 44.
 Craig, T. B., Painting, 17.
 Cramer, A. S., 32.
 Crano, F. F. de, Painting, 17.
 Crank, G., Sculpture, 34.
 Crecco, J., Photographs, 53.
 Cropsey, I. F., Paintings, 17.
 Crosson, Miss E., Painting, 39.
 Crosscup & West, 30.
 Crossbey, E. H., & Co., 30.
 Crouillebert, P. D., Painting, 39.
 Crehet, Lithographs, 41.
 Cremer, J., Photographs, 58.
 Creifelds, R., Painting, 17.
 Crider & Bros., Photographs, 56.
 Croff & Camp, Drawings, 31.
 Croft, G. B., Drawings, 31.
 Crupheme, A. J., Painting, 39.
 Crépinet, A., Architectural designs, 42.
 Culverhouse, J. M., Painting, 17.
 Cunaëus, C., Painting, 43.
 Currier, J. F., Painting, 17.
 Curzon, P. A. de, Painting, 36.
 Cuypers, P. J. H., Sculpture, 43.
 Dahl, H., Painting, 49.
 Dahlgreen, C., Painting, 17.
 Dalou, J., Sculpture, 34.
 Dameron, E. C., Painting, 36.
 Daniels, G. F., Painting, 17.
 Darley, F. O. C., Paintings, 25, 27; Drawings, 29.
 Darrah, S. T., Painting, 17; Water color, 26.
 Dart, M., Painting, 17.
 Daubigny, K. P., Painting, 36.
 Dauthendey, Photographs, 43.
 David, V., Photographs, 41.
 Davila, D., Painting, 51.
 Day, F., Paintings, 33.
 Debat-Ponson, E. B., Painting, 36.
 Deblois, C. A., Engraving, 40.
 De Coninck, P., Painting, 36.
 De Gollier, Miss K. E., Paintings, 17.
 De Haas, M. F., Paintings, 17.
 Delamantu, A. S., Photographs, 56.
 De la Lalande, C. L., Architec. designs, 42.
 Delau, S. J., Photographs, 56.

- Delauney, A. A., Engraving, 40.
 Del Castillo, B., Painting, 53.
 Delabbe, F. A., Painting, 36.
 Delden, van, Photographs, 43.
 Delevan, C. H., Photographs, 56.
 De Luce, Painting, 17.
 Deming, Miss C., Painting, 17.
 Demorest, W., Engraving, 30.
 Derrick, E. I. M., Painting, 26.
 Deshayes, Ch. F. E., Painting, 37.
 De Silva, A., Photographs, 56.
 Destree, J., Painting, 44.
 Devaux, F. A., Sculpture, 34.
 Deventer, L. F. van, Painting, 44.
 Deventer, W. A. van, Painting, 44.
 De Voe, W. M., Painting, 17.
 Devrez, D. H. L., Photographs, 41; Architectural designs, 42.
 Diaz, Josefa, Paintings, 53.
 Dielman, F., Painting, 17.
 Diesen, A. E., Painting, 49.
 Dietrichson, Mrs. M., Painting, 47.
 Dirkson, F., Painting, 17.
 Dole, C. B., Pen work, 32.
 Dolph, I. H., Painting, 17.
 Doolittle, E. S., Painting, 17.
 Doremus, J. P., Photographs, 56.
 Dotterer, A. F., Photographs, 56.
 Doty Bros., Sculpture, 28.
 Doublemard, A. P., Sculpture, 34.
 Dougherty, E. D., Painting, 17.
 Douillard, A. M. L., Painting, 36.
 Doux, Miss L., Painting, 36.
 Dow, G., Painting, 54.
 Dreka, L., Engravings, 29.
 Drexler, A., Painting, 17.
 Du Bois, C. E., Painting, 17.
 Dubos, Miss A., Painting, 36.
 Dubouchet, H. J., Painting, 36; Engraving, 40.
 Dubucand, A., Sculpture, 34.
 Ducci, C., Sculpture, 50.
 Duez, E. A., Painting, 36.
 Dumas, Mrs. E., Painting, 39.
 Dumaine, Sculpture, 51; Painting, 51.
 Dumaresq, A., Painting, 37.
 Duncker, A., Engravings, 42.
 Dunham, Mrs. F. S., Photographs, 56, 58.
 Dunlap, W., Painting, 54.
 Dupré, L. V., Painting, 36.
 Duplain, Mrs. A., Painting, 39.
 Duran, C., Painting, 36.
 Durand, A. B., Painting, 17; Drawings, 27.
 Durand, F. J., Water color, 26.
 Durst, A., Painting, 37.
 Durst, M. P., Sculpture, 34.
 Duval, V., Painting, 54.
 Duverger, F. J., Painting, 36.
 Dwyer, E. J., Inlaid picture, 30.
 Eakins, T., Painting, 17.
 Earle, J., Painting, 17.
 Eaton, J. O., Painting, 26.
 Ebersbach, J. D., Painting, 44.
 Echave, B. de, Painting, 51.
 Eckardt, C., Paintings, 46.
 Edgar, Miss L., Painting, 27.
 Eerelman, O., Painting, 44.
 Egenberger, J. H., Painting, 44.
 Ehler, I. D., & Co., Lithograph, 30.
 Eickelberg, W. H., Painting, 44.
 Ekström, P., Painting, 47.
 Eliot, G., Painting, 37.
 Elkins, H. A., Painting, 17.
 Elliott, C. L., Painting, 17.
 Ellis, S. A., Statuary, 15; Drawing, 29.
 Elten, K. van, Painting, 26.
 Engström, W. O., Painting, 47.
 Enneking, J. E., Painting, 18.
 Enriquez, N., Painting, 51.
 Entomological Society of New South Wales, Photographs.
 Epinette, Mrs. M., Painting, 39.
 Erhard, Engravings, 41.
 Essen, J. C. van, jr., Painting, 44.
 Etex, A., Photographs, 41.
 Evans, B. R., Painting, 17.
 Evans, E. D., Photographs, 56.
 Evans, G. & W. P., Photographs, 58.
 Evans, De Scott, Painting, 17.
 Evans, O. C., Decorations, 34.
 Everdingen, A. van, Painting, 44.
 Eversen, A., Painting, 44.
 Ewell, D., Painting, 18.
 Faber, H., Painting, 26.
 Fabronius, D. C., Paintings, 18.
 Fagerlin, F., Painting, 47.
 Fahlgren, C. A., Painting, 47.
 Fairfax, I. S., Drawings, 31.
 Faivre-Duffer, L. S., Paintings, 37.
 Falcener, J., Painting, 26.
 Faleini, A., Mosaics, 51.
 Falk, R., Photographs, 43.
 Farmer Bros., Photographs, 33.
 Farrer, H., Painting, 18.
 Farris, W. A., Painting, 18.
 Fassitt, Mrs. C. A., Painting, 18.
 Feldman, C., Painting, 18.
 Felon, J., Sculpture, 39; Engraving, 40.
 Fenety, A. C., Drawing, 29.
 Fenn, S. H., Paintings, 18.
 Fernandez, J., Sculpture, 51.
 Ferrando, S., Painting, 51.
 Ferri & Bartolozzo, Sculpture, 50.
 Ferris, S. J., Engraving, 27.
 Ferry, J. G., Paintings, 37.
 Ferstew, C., & Co., Lithographs, 46.
 Fery, Mrs. L., Painting, 37.
 Feyen, E., Painting, 37.
 Feyen-Perrin, F. N. A., Painting, 37.
 Fick, F., Sculpture, 28.
 Figuera, G., Painting, 51.
 Fine Arts Association, Paintings, 33.
 Firm, J. C., & Co., Paper hangings, 31.
 Fischer, A., Marbelized glass, 32.
 Fisher, E., Painting, 18.
 Fisher, C. P., Photographs, 56.
 Fisher, F. J., Painting, 18.
 Fisher, Mrs. J. F., Mosaics, 31.
 Fitch, J. L., Painting, 18.
 Fitzpatrick, A., & Co., Painting, 28; Window glass, 31.
 Fitzgibbon, J. H., Daguerreotypes, 30.
 Fjeldskov, V., Sculpture, 46.
 Fladmoë, T. C., Engraving, 49.
 Flagg, H. C., Painting, 18.
 Flagg, J. B., Painting, 18.
 Flameng, L., Engraving, 41.
 Fletcher, T. S., Drawings, 29.
 Fletcher, V., Painting, 18.
 Flier, H. R. van der, Painting, 44.
 Flores, R., Painting, 51.
 Florman, G., Photographs, 48.
 Flourselling, C. H., Engravings, 33.
 Flug, A., Painting, 18.
 Faerster, E., 30.
 Folsom, J. H., Photographs, 56.
 Forbes, Col., Engravings, 27.
 Forbes, Edwin, Engravings, 29.
 Ford, H. C., Painting, 18.
 Foreign Artists, Engravings, 27.
 Forsyth, R., Statuary, 33.
 Fowler, T. T., Painting, 18.
 Fowle, A. H., Drawings, 27.
 Framolini, T., Mosaics, 51.
 Francati & Santamaria, Sculpture, 51.
 French, W. H., Models, 31.
 Frederick & Bro., Glass, 31.
 Francati & Santamaria, Mosaics, 50.
 Fraser, Chr., Gilt frames, 32.
 Frauenfelder, G., Lithographs, 50.
 Frederick, C. D., & Co., Photographs, 56.
 Fredericks, A., Paintings, 26.
 Freeborne, S. M., Sculpture, 15.
 Freeman, A. D., Photographs, 56.
 Freeman, A., Vase, 32.
 Freeman, J. E., Sculpture, 15.
 French, D. C., Statuary, 15.
 French, J. A., Photographs, 56.
 Frenchard, E., Painting, 18.

- Frac-Robert & Fils, Sculpture, 34.
 Frick, F., Drawing, 29.
 Froment-Meurice, Models, 42.
 Frullini, L., Sculpture, 50.
 Fry's Engraving Office, Engravings, 28.
 Furness, H. H., Painting, 18.
 Gabineau, J. A. C. de, Sculpture, 34; Medallion, 35.
 Gaillard, C. F., Engraving, 41.
 Gaillard, E., Chromo-lithographs, 42.
 Galli Brothers, Sculpture, 50.
 Galinde, R. E., Painting, 18.
 Galland, A. H., Painting, 18.
 Gallandz, L. A., Mosaics, 51.
 Galvan, I. E., Painting, 18.
 Galvan, Mrs. S. M., Painting, 18.
 Gardell, Miss A., Painting, 48.
 Gardener, E. I., Painting, 18.
 Gardener, D. W., Canvass stretchers, 32.
 Gargini, C., Sculpture, 50.
 Garnier, J. A., Painting, 37.
 Garrdent, A., Sculpture, 15.
 Garret, R., Painting, 54.
 Gattinoni, Carlos, Paintings, 53.
 Gaucherel, L., Engravings, 41.
 Gaudez, Miss C. D., Painting, 39.
 Gautherin, J., Sculpture, 34.
 Gay, W. A., Painting, 18.
 Gay, E., Painting, 18.
 Gay, W., Painting, 18.
 Gazette des Beaux-Arts, Engravings, 41.
 Geiser, Frederico, Photographs, 54.
 Gempt, B. H., Painting, 44.
 Gerardin, G., Sculpture, 15.
 Gerlach & Fromhagen, Photographs, 56.
 Gerry, S. L., Painting, 19.
 Gentill, C., Photographs, 56.
 Giani, E., Sculpture, 50.
 Gibson, J., Engraving, 30.
 Giddings, T., Frame, 28.
 Gide, T., Painting, 37.
 Gifford, R. S., Painting, 18; Water color, 26.
 Gignoux, R., Painting, 18.
 Gilbert, S. D., Painting, 26.
 Gillot & Son, Engravings, 41.
 Girard, N. J., Sculpture, 34.
 Girard, J., Photographs, 41.
 Girardi, F., Drawings, 29.
 Glaize, P. P. L., Painting, 37.
 Gogler, L., Painting, 18.
 Goldsmith, J. H., Photographs, 56.
 Good, F. M., Photographs, 56.
 Goodes, E. A., Painting, 19.
 Gookins, J. F., Painting, 18.
 Goossens, J., & Son, Painting, 43.
 Goupil & Co., Photographs, 47.
 Government of New Zealand, Photographs.
 Grace, J., Sculpture, 15.
 Graff Bros., Lithographs, 27, 30.
 Graham, W., Painting, 18; Water color, 26.
 Granbey, Miss V., Painting, 18.
 Granbey, Miss H. A., Painting, 18.
 Grandchamps, L. E. P., Painting, 37.
 Granger, P. E., Sculpture, 15.
 Granger, F., Painting, 18.
 Granges, Baron P. des, 56.
 Grant, A. G., Photographs, 56; Architectural designs, 34.
 Graphic Company, Engravings, 27.
 Gray, H. P., Painting, 18.
 Gray, G., China, 28.
 Gray, F. W., Engravings, 53.
 Grayon, C. P., Painting, 18.
 Graves, Miss L. P., Painting, 18.
 Graves, J. A., Photographs, 56.
 Greatorex, Engravings, 27.
 Greatorex, Mrs. E., Painting, 18.
 Green, F. W., Painting, 10.
 Greene, E. D. E., Painting, 18.
 Gregari, L., Painting, 18.
 Greig, A. E. N., Decorations, 34.
 Grenier, H. N., Photographs, 33.
 Greive, J. C., jr., Painting, 44.
 Griffin, J., Painting, 15.
 Grimelund, J. M., Painting, 49.
 Griot, A., Miscellaneous, 27.
 Groiseilliez, M. de, Painting, 37.
 Groot, J. de, Painting, 44.
 Gruijter, W., jr., Painting, 44.
 Gruger, P. E., Letters, 32.
 Guarnerio, Sculpture, 54.
 Gude, H., Painting, 49.
 Gudin, T., Painting, 19, 37.
 Guebelman, T., Photographs, 56.
 Gueneux & Normand, E., Lithographs, 41.
 Guerber, S. L., Painting, 18.
 Gucrea, G., Sculpture, 51.
 Guidi, Federigo, & Billi, Photographs, 50.
 Guillois, Mrs. C., Painting, 39.
 Guillon, A. T., Painting, 37.
 Gunnington, Miss, Painting, 18.
 Gunnison, Miss M. D., Painting, 18.
 Gutekin, W. G., Photographs, 58.
 Gutekunst, F., Photographs, 56.
 Guthers, C., Painting, 18.
 Gutierrez, F., Painting, 51.
 Gutierrez, R., Painting, 51.
 Guy, S. J., Paintings, 18.
 Haanen, A., Painting, 44.
 Haas, A., Models, 28.
 Haas, M. F. H. de, Painting.
 Hackett, C. C., Painting, 19.
 Hafström, A. G., Painting, 47.
 Hägg, J., Painting, 48.
 Haight, H. J., Painting, 19.
 Hale, E. D., Painting, 19.
 Hall, J., Photographs, 56.
 Hall, C., Painting, 19.
 Halliday, N. H., Panels, 32.
 Halon, A., Decorations, 34.
 Hamilton, H., Painting, 19.
 Hammer, W., Painting, 46.
 Hammer, G. D., Lithographs, 30.
 Hammer, H. J., Painting, 46.
 Hance, A. L., Photographs, 58.
 Hand, A. N., Photographs, 56.
 Handy, Painting, 20.
 Hanedoes, L., Painting, 44.
 Hanno, W., Painting, 49.
 Harnoteau, N., Painting, 37.
 Hanrath, F., Painting, 44.
 Hansen, H., Painting, 46; Carvings, 49.
 Harding, J. E., Photographs, 59.
 Harding, J., Painting, 54.
 Haring, J. C., Photographs, 56.
 Harley, J. K., Lithographs, 30.
 Harmann, J. S., Decorations, 34.
 Harnett, W., Painting, 19.
 Harnron, A., Painting, 26.
 Harpignies, H., Painting, 37.
 Harran, J., Painting, 52.
 Harris, P. S., Painting, 19.
 Harris, W., Photographs, 58.
 Harrison, H., Painting, 19.
 Harrison, Miss H. N., Painting, 19.
 Harrison, Miss S. W., Paintings, 33.
 Hart, E. H., Photographs, 56.
 Hart, J. M., Paintings, 19.
 Hart, Wm., Water color, 26.
 Harterick, H., Painting, 19.
 Hartwell, H. E., Drawings, 31.
 Hartley, I. S., Sculpture, 15.
 Hasselrüs, D., Painting, 46.
 Haseltine, W. S., Painting, 20.
 Haskell, S. E., Painting, 19.
 Haworth, J., Photographs, 58.
 Hayward, H. D., Painting, 19.
 Hazeu, A. C., Painting, 44.
 Hazen, Mrs. E. M., Paintings, 33.
 Hazzard, R. T., Ornaments, 31.
 Heade, M. I., Painting, 19.
 Healy, G. P. A., Painting, 19.
 Hearn, C. W., Photographs, 58.
 Heaton, A. G., Painting, 19.
 Heath & Kendrick, Ornamentation, 31.
 Heerebaart, G., Painting, 44.
 Heemskerck, J. E. van B., Painting, 44.

- Held, Ch., Engraving on gold, 30.
 Heldebran, H. T., Engravings, 41.
 Hellquist, H., Painting, 47.
 Helst, V., Painting, 54.
 Hemshek, Painting, 54.
 Hemmüller, W., Painting, 27.
 Henderson, A., Photographs, 33.
 Hendrickson, S., Drawings, 29.
 Henkes, G., Painting, 44.
 Henning, H. D. A., Painting, 19.
 Hennig, R., Photographs, 43.
 Henry, E. L., Paintings, 19.
 Henshelwood, C. B. & R., Paintings, 19.
 Hepburn, W., Painting, 19.
 Hermelin, Baron O., Painting, 47.
 Hernandez, J., Painting, 51.
 Herpin, L., Painting, 37.
 Herrick, H. W., Painting, 26.
 Herst, A. C. J., Painting, 37, 39.
 Hertzberg, A. G., Painting, 47.
 Herzog, H., Painting, 19.
 Herzog, J., Photographs, 43.
 Hess, J., Designs, 31.
 Hessler, A., Photographs, 56.
 Hetzel, G., Painting, 19.
 Hetsch, C., Designs, 46.
 Heyl, M., Painting, 44.
 Hicks, T., Paintings, 19.
 Higgins, G. F., Painting, 19.
 Hildebran, H. T., Engraving.
 Hildebrand, Miss C., Drawing, 39.
 Hill, T., Painting, 19.
 Hill, J. W., Water color, 26.
 Hillemacher, E. E., Painting, 37.
 Hillyer, H. L., Painting, 19.
 Hilverdink, J., Painting, 44.
 Hilverdink, E. A., Painting, 44.
 Hinckley, T. H., Painting, 19.
 Hirsh, J. M., Photographs, 58.
 Hurlinger, C. W., Enameled works, 28.
 Hirsch, A., Painting, 37.
 Hirst, Miss C. R., Painting, 19.
 Hoar, W., Inlaid work, 31.
 Hobbs, R. S., & Co., Paper, 31.
 Hobbs & Son, Painting, 26; Drawing, 31.
 Hobbs, Architectural designs, 27; Painting.
 Hobcndan & Mildrum, Painting, 34.
 Hoefel, F., Painting on glass, 27.
 Hoesslin, G., Painting, 19.
 Hoffman, F., & Sons, Miscellaneous, 28; Mo-
 saics, 31.
 Hober, H., Photographs, 56.
 Holbrook, Painting, 19.
 Holin, G. R., Designs, 31.
 Holm, P. D., Painting, 47.
 Holmer, T. H., Painting, 19.
 Holmes, G. W., Painting.
 Holmes, J., Sculpture, 28.
 Hollander, H., Cz., Painting, 44.
 Hollyer, S., Engravings, 27, 29.
 Holmlund, Miss J., Painting, 47.
 Holst, J. G. von, Painting, 49.
 Homer, W., Painting, 19; Water color, 26.
 Homer, Lee & Co., Engravings, 29.
 Hondekoeter, Painting, 54.
 Hooe, J. H. van, Painting.
 Hoover, Jas., Chromos, 30.
 Hope, J., Painting, 19.
 Hopkins, R., Painting, 19.
 Hoppe, E., & Co., Oil prints, 42.
 Hopps, H. H. H., Painting, 19.
 Hopson, W., Miscellaneous, 31.
 Horn, H. E. van, V., Painting, 19.
 Horning, F. L. B., Tokens, 32.
 Horton, E. W., Painting, 20.
 Hosch & Frankenburger, Oil prints, 42.
 Houten, Mevr. von, Painting.
 Hovey, E. Y., Photographs, 56.
 Hove, J. H. van, Painting, 44.
 Hove, B. J. van, Painting, 44.
 Howell, Mr. J. R., Painting, 19.
 Howell, J. R., Photographs, 56.
 Huas, P. A., Painting, 37.
 Hubbard, Paintings, 19.
 Huldberg, F., Lithographs, 48; Photographs.
 Hulei, F., Photographs, 43.
 Hugard, C. S., Painting, 37.
 Hunckel, G., Engravings, 42.
 Hunt, W. M., Painting, 20.
 Hunt, Painting, 19.
 Hunt, R. H., Drawings, 31.
 Hunter, T., Chromos, 30.
 Huntington, D., Paintings, 19.
 Hutinet, J. D., Photographs, 58.
 Huybers, J. D., Painting, 44.
 Hyatt, Mrs. D., Painting, 20; Water color, 26.
 Hygen, B., Painting, 49.
 Hynemann, H. N., Painting, 19.
 Illingworth, W. H., Photograph, 56.
 Inman, H., Painting, 20.
 Insley, A., Painting, 20.
 Irving, J. B., Paintings, 20.
 Israëls, J., Painting, 44.
 Itassc, A., Sculpture, 34; Painting, 84.
 Itajaky, Colony of, Photographs, 52.
 Jackta, Miss L. A., Painting, 39.
 Jacobi, Photographs, 43.
 Jacobsen, S., Painting, 49.
 Jacomin, A. L., Painting, 37.
 Jacquand, C., Painting, 37.
 Jacquemart, J. F., Engravings, 41.
 Jacquier, E., Sculpture, 15.
 Jadin, E., Painting, 37.
 James, F., Painting, 20.
 James, Mrs. J. A., Paintings, 33.
 Japy, L. A., Painting, 37.
 Jarvis, M., Painting, 20.
 Jenger, H., Photographs, 56.
 Jernberg, A., Painting, 47.
 Jernberg, O., Painting, 47.
 Jerome, E. G., Painting, 20.
 Jimenez, J., Painting, 51.
 Jimenez, R., Painting, 51.
 Jobbé-Duval, Paintings, 37.
 John, J., Painting, 20.
 Johns, C. M., Painting, 20.
 Jolinsen, E., Painting, 54.
 Johnson, F., Painting, 20.
 Johnson, E., Painting, 20.
 Johnson, D., Painting, 20.
 Johnson, J. L., Painting, 20.
 Johnson, E. L., Photographs, 33.
 Johnson & Dyer, Lithographs, 30.
 Jones, A., Painting, 20; Photographs, 58.
 Jones, H. B., Painting, 20.
 Jong, G. de, Photographs, 45.
 Joosten, D. J. H., Painting, 44.
 Jordan, A. W., Drawings, 29, 30.
 Juarez, L., Painting, 51.
 Juarez, J., Painting, 51.
 Judge, E. S., & Co., Ornaments, 31.
 Julio, E. B. D., Painting, 20.
 Jundt, G., Painting, 37.
 Kaarstad, J. O., Painting, 49.
 Kaehler, G., Industrial designs, 31.
 Kaffel Frères, Sculpture; Bronzes, 42.
 Kallenberg, A. B., Painting, 47.
 Kappes, A., Painting, 20.
 Kappeler, T., Imitations, 32.
 Kate, H. F. C., ten, Painting, 44.
 Kate, J. M. H., ten, Painting, 44.
 Kaufmann, T., Painting, 20.
 Kaufman, A. & C., Oil prints, 42.
 Kellen, D. von dar, jr., Painting, 44.
 Keller, F. A., Sculpture, 35.
 Kelly, Mrs. J. W., Painting, 20.
 Kelly, Wm. J., Typographic art, 32.
 Kemeys, E., Painting; Sculpture, 15.
 Kendall, T. A., State seals, 28.
 Kendrick, D. T., Painting, 20.
 Kennedy, W. E., Pictures, 32.
 Kensett, J. F., Painting, 20.
 Kester, H., Painting, 20.
 Kever, J. S. H., Painting, 44.
 Kew, J. H., Photographs, 56.
 Keyser, J. G., Painting, 29; Lithographs, 30.
 Kichholz, B., Photographs, 57.
 Kienlin, J., Painting, 37.

- Kiewning, Photographs, 43.
 Kilburn, B. W., Photographs, 57.
 Kinder, E., Wool pictures, 32.
 Kimney, J. D., Engraving, 29.
 King, G. W., Painting, 20.
 Kirkpatrick, C. & W., Painting, 32.
 Klem, F., Photographs, 49.
 Kluyver, P. L. F., Painting, 44.
 Knight, D. R., Painting, 20.
 Knocke, W. C., Painting, 20.
 Knox, G. W., Models, 28.
 Knudsen, C., Photographs, 49.
 Knudsen, K., Photographs, 49.
 Kock, Miss E., Painting, 37.
 Koekkoek, H. P., Painting, 44.
 Koekkoek, W., Painting, 44.
 Kolkow, F. J. von, Photographs, 45.
 Kollock, M., Painting, 20.
 Kool, S., Painting, 44.
 Koskull, A. G., Painting, 47.
 Kosler, J., Photographs, 43.
 Koster, E., Painting, 44.
 Kraft, F., Illuminated work, 32.
 Kremer, J. M., Photographs, 43.
 Kretschman, E. A., Sculpture, 15.
 Kreutzberg, Ch., Wax model, 32.
 Kruseman, H. D. van Elten, Painting, 44.
 Kulle, J., Painting, 47.
 Kunath, O., Painting, 20.
 Kurtz, W., Painting, 27; Photographs, 57.
 Kuwassey, C. J., Painting, 37.
 Kylberg, Miss R., Painting, 48.
 Lacretelle, J. E., Painting, 37.
 Lacroix, Miguel, Decorations, 53.
 La Farge, J., Painting, 20.
 Laffon, Photographs, 41.
 Lagerholm, Miss W., Painting, 47.
 Laguillerimie, F. A., Painting, 41; Engraving, 37.
 Lairesse, G., Painting, 54.
 La Kochenoire, C. J., Painting, 37.
 Lambdin, J. R., Painting, 20.
 Lambdin, G. C., Painting, 20.
 Lambert, A. E., Painting, 37.
 Lami, di Nozan, C. E., Painting, 39.
 Lamotte, A., Engraving, 41.
 Lamson, J. H., Photographs, 57.
 Lalanne, M., Engraving, 39, 41.
 Lalande, C. L., Architectural design.
 Landelle, Ch., Painting, 37.
 Landy, J., Photographs, 57.
 Lange & Bro., Mosaics, 31.
 Lang, L., Painting, 20.
 Lanson, E., Sculpture, 35.
 Laplante, C., Engraving, 41.
 Laporte, M., Painting, 37.
 Laporte, E. H., Painting, 38.
 Lardham, T., Decorations, 34.
 Larson, Miss V., Painting, 48.
 Lauderbach, J. W., 30.
 Laurent, H., Painting, 38.
 Lawrie, A., Painting, 20.
 Lawton, L. W., Photographs, 57.
 Lays, J. P., Painting, 37.
 Lazarus, J. H., Painting, 20.
 Lea, A. M., Painting, 20.
 Lebel, E., Painting, 37.
 Lebrethon, J., Medallions, 28.
 Lechesne, A. J. B., Sculpture, 35.
 Le Clair, Painting, 20.
 Le Coite, A. J. L., Sculpture, 35.
 Le Duc, M. V., Miscellaneous, 55.
 Lee, W., Decorations, 34.
 Lefman, Photographs, 41.
 Légat, L., Painting, 37.
 Leggo Bros., Engravings, 30.
 Legras, A., Lithographs, 41.
 Leland, H., Painting, 20.
 Lelux, A., Painting, 37.
 Lely, P., Sir, Painting, 54.
 Lenz, F., Engravings, 42.
 Léon, Vidal, Photographs, 42.
 Leonardo da Vinci, Painting, 54.
 Leoni, A., Sculpture, 50.
 Leonhardt, T., & Son, 30.
 Lepesqueur, H., Paintings, 37.
 Lerche, V., Painting, 49.
 Lesrel, A. A., Painting, 38.
 Lestang Larade, L. de, Painting, 39.
 Leuce, P. D., Painting, 20.
 Leuzinger, Photographs, 52.
 Levasseur, J. G., Engraving, 41.
 Levi, H., Penmanship, 32.
 Levy, T. S., Drawings, 31.
 Levy, G., Engraving, 41.
 Levy, A., Photographs, 57.
 Levy, J., & Co., Photographs, 41, 57.
 Lewis, E. D., Painting, 20.
 Lewis, T., Photographs, 57.
 Leyendecker, F. M., Painting, 37.
 Lezcamo, Francisco A., Photographs, 53.
 Libarty, J. C. Z., Miscellaneous, 28.
 Lichtenfelder, Sculpture; Models, 41.
 Liebert, A., Photographs, 41.
 Libert, A., Industrial designs, 42.
 Libreria, S., Lithographs, 50.
 Liljeström, A., Architectural drawings, 48.
 Lindahl, A., Photographs, 48.
 Lindegren, Miss A., Painting, 47.
 Lindemann, C. F., Painting, 20.
 Lindman, A., Painting, 47.
 Lindner, R., Models, 28.
 Lingeman, L., Painting, 44.
 Lithografiska Aktibolaget, Lithographs, 48.
 Lippencott, W. H., Painting, 20.
 Lockwood & Randolph, Pressed wood, 30.
 Lockwood, W. H., Engraving, 28.
 Loescher, Petsch, Photographs, 43.
 Loebnitz, C., Designs, 31.
 Loison, P., Sculpture, 35.
 Lokhorst, D. van, Painting, 44.
 Longacre & Co., Engraving, 30.
 Longfellow, E. W., Painting, 20.
 Loop, Mrs. H. A., Painting, 20.
 Loop, Henry A., Painting, 20.
 Lorck, K. J., Painting, 49.
 Lorin, A. C., Glass work, 39.
 Lortet, L. O., Painting, 37.
 Löfgren, Miss K., Painting, 47.
 Löfström, Miss S., Photographs, 48.
 Lönnroth, F., Painting, 47.
 Lowell, J. A., & Co., Engravings, 29.
 Luminais, E. N., Painting, 37.
 Lundberg, W. A., Photographs, 48.
 Lundmark, A., Sculpture, 46.
 Luppen, F. van, Sculpture, 33.
 Lydston, F. A., Painting, 20.
 Lynch, A. K., & Co., Staining, 31.
 Maaten, J. J. van der, Painting, 44.
 Machen, W. H., Painting, 21.
 MacGrath, T. J., Carvings, 28.
 MacKnight, S. R., Paintings, 21.
 Macy, W. E., Painting, 21.
 Macy, R. H., & Co., 32.
 Makart, H., Painting, 54.
 Maerz, A. J., Painting, 21.
 Magrath, W., Water color, 26.
 Magrath, Paintings, 21.
 Magrath, W., Painting, 21.
 Maija, C., Photographs, 50.
 Maignan, A., Painting, 38.
 Maillart, D. U. N., Painting, 38.
 Mallet, J., Painting, 38.
 Malmström, J. A., Drawings, 48.
 Malmström, J. A., Painting, 47.
 Manners, Miss A. F., Monograms, 28.
 Manchola, J., Painting, 51.
 Mansuy, Dotin I., Painting, 39.
 Manuel, Father, Painting, 51.
 Maningstern, P., Precious stones, 32.
 Marcellin, J. E., Sculpture, 35.
 Marchand, L. L., Models, 41.
 Marchant, E. D., Painting, 21.
 Marcy, L. G., Photographs, 58.
 Mares, W., Painting, 44.
 Markham, C. C., Painting, 21.
 Marroig, Gabriel Juan, Painting, 53; Sculpture, 54.

- Marshall, A., Photographs, 57.
 Marshall, W. E., Painting, 21; Engraving, 27.
 Marshall, S. S., Stained glass, 31.
 Martens, W. J., Painting, 44.
 Martin, H., Painting, 21.
 Martin, G., Sculpture, 35.
 Martin, F., Sculpture, 35.
 Martin, E., Painting, 38.
 Martin, Miss E., Painting, 21.
 Martin, Mrs. L. E., Panels, 27.
 Martino, de, Painting, 52.
 Martin, L. E., Painting,
 Marven, Miss E. G., Bark picture, 34.
 Mary, Mrs. M., Drawing, 40.
 Mason, O. G., Photographs, 57.
 Masson, Miss A., Painting, 38.
 Masure, S., Painting, 38.
 Masurel, J. E., Painting, 44.
 Mathews, W. F., Paintings, 21.
 Mathews, W., Paintings, 21.
 Mathieu, O. P., Painting, 38.
 Mattarelli, A., Sculpture, 50; Mosaics, 51.
 Matthews & Warren, Printing, 32.
 Maussion, Miss E. de, Painting, 39; Drawing, 40.
 Mauve, A., Painting, 44.
 MaVelasquez, J., Painting, 52.
 Mayer, C., Engravings, 30; Paintings, 42, 54.
 Mayer, F. B., Painting, 21.
 Maynard, Painting, 33.
 Maynard, G. W., Painting, 21.
 Maynicke, Miss E., Painting, 21.
 Mayo, T. H., Photographs, 57.
 Mazzotti, A., Architecture, 50.
 McCollin, T. H., Photographs, 58.
 McCormick, J. L., Photographs, 57.
 McCracken, S., Mosaics, 31.
 McDonald, M. J., Paintings, 26.
 McEntee, J., Painting, 21.
 McGregor, G. S., Graining, 31.
 McEntee, Painting, 54.
 McIntyre, J. L., Photographs, 57.
 McLellan, D. M., Lithography, 30.
 McLees, Engraving, 29.
 McNurtree, L. G., Painting, 21.
 McPherson, W. J., & Co., Windows, 32.
 McRea, J. C., Engravings, 27, 29.
 Meckeprang, A., Painting, 46.
 Mégret, L. N. A., Sculpture, 35.
 Melby, W., Painting, 46.
 Mellé, A. L., Painting, 38.
 Melrose, A., Painting, 21.
 Mendoza, F., Painting, 52.
 Méne, P. J., Sculpture, 45.
 Menon, Miss M. L., Drawings, 40.
 Mermet, Mrs. C., Painting, 39.
 Méry, A. E., Painting, 38.
 Merritt, J. P., Engraving, 33; Painting.
 Mesch, J. A., Sculpture, 46.
 Mesdag, Mrs., Painting, 44.
 Mesdag, H. W., Painting, 44.
 Metzner, H., Drawings, 29.
 Meyer, C., Carvings, 28.
 Meyer, H., Sculpture.
 Meyer, J., jr., Engravings, 29.
 Meyer, Ferd., Engravings, 30.
 Meyer, J., Photographs, 57.
 Meyer, W., Engravings, 48.
 Meyers, A., Photographs, 57.
 Meynen, F., Sculpture, 15.
 Michel, E. B., Painting, 38.
 Michel, L., Sculpture; Models, 41.
 Middlemiss & Hunter, Photographs, 33.
 Mifflin, Lloyd, Painting, 21; Engravings, 27.
 Miguel, M. Y. R., Painting, 51.
 Miller, C. H., Painting, 21.
 Miller, E. F., Painting, 26.
 Miller, W., Sculpture, 15.
 Millett, F. D., Painting, 21.
 Minor, R. C., Painting, 21.
 Mischewsky, R., Photographs, 43.
 Mitchell, H., Impressions, 28.
 Mittermaier, M., Glass, 31.
 Moeller, F. G., Drawing, 31.
 Moglia, A., Mosaics, 51.
 Molinari, Joaquin, Sculpture, 54.
 Molkenboer, W. B. G., Architectural designs, 45.
 Moller, N. B., Painting, 49.
 Monfallet, A. F., Painting, 38.
 Monginot, C., Painting, 38.
 Monks, J. A., Painting, 21.
 Monroy, P., Painting, 51.
 Montalant, J. O. de, Painting, 21.
 Montelatici, A., & Bro., Mosaics, 51.
 Montelatici, G., Mosaics, 51.
 Moore, H. H., Painting, 21.
 Moore, H. K., Painting, 21.
 Moore, A. W., Engravings, 33.
 Moore, R. E., Engravings, 29.
 Mora, J. M., Photographs, 57.
 Moran, T., Painting, 21; Water color, 26.
 Moran, E., Painting, 21.
 Moran, P., Painting, 21; Engravings, 27.
 Morand, A., Painting, 21.
 Moreau-Vauthier, Sculpture, 35.
 Morel, A., Sculpture; Models, 41.
 Morrell, Mrs. I., Painting, 21.
 Morini, F., Sculpture, 50.
 Morrison, J. C., Painting, 33.
 Morin, E., Painting, 38.
 Morris, W. V., Glass sign, 32.
 Morton, J. D., Photographs, 33.
 Mosher, C. S., Photographs, 57.
 Mota, A. da, Photographs, 52.
 Moulin, H., Sculpture, 35.
 Muller, R. A., Engravings, 40.
 Muller, E., & Co., Mosaics, etc., 27, 42.
 Mulvaney, J., Painting, 21.
 Mundhenk, A., Sculpture, 15.
 Mungoe, G., Painting, 26.
 Munier, E., Painting, 38.
 Munzig, G. C., Drawings, 27.
 Muntz, Bro., & Co., Engravings, 30.
 Muratori, Jose, Painting, 53.
 Muraton, A., Painting, 38.
 Euraton, Mrs. E., Painting, 38.
 Muraacer, T., Photographs, 58.
 Murillo, Painting, 54.
 Murphy, Miss E., Drawings, 29.
 Murtland, M. M., Painting, 21.
 Musollino, Salvador, Sculpture, 54.
 Müsler, W., Painting, 21.
 Nagle, Cooke, & Ewing, Paper hangings, 31.
 Nakken, W. C., Painting, 44.
 Nason Novelty Co., Photographs, 58.
 National Porcelain Manf. Co., Drawings, 40.
 National Bank Note Co., Engravings, 29.
 N. N., Lithographs, 52.
 Neagle, J., Painting, 54.
 Nelli, A., Sculpture, 50.
 Netscher, G., Painting, 54.
 Newberg, R., Painting, 21.
 Newell, R., & Son, Photographs, 57, 58.
 Newell, H., Painting, 21.
 New England Granite Works, Sculpture, 31.
 Newman, A., Photographs, 57.
 Newton, H. D., Photographs, 57.
 Nichols, H. H., Engraving, 29.
 Nicoll, J. C., Paintings, 21; Water color, 26.
 Nicolas, Mrs. M. J., Painting, 38.
 Nicolaysen, L. W., Painting, 49.
 Nielsen, A., Painting, 49.
 Nielssen, J., Painting, 49.
 Niffen, P. A., Painting, 21.
 Nilsson, S., Painting, 47.
 Noble, T. S., Painting, 21.
 Nold, Miss H., Painting, 40.
 Nordenberg, B., Painting, 47.
 Nordgren, Miss A., Painting, 47.
 Nordgren, A. D., Painting, 47.
 Nordlander, Miss A., Painting, 47.
 Norelli, L., & Co., Mosaics, 51.
 Norman, A., Painting, 49.
 Norton, W. E., Painting, 21.
 Noterman, Z., Painting, 38.
 Notman, W., Photographs, 33; Paintings, 33.
 Obernetter, J. B., Photographs, 43.

Ocaranza, M., Painting, 52.
 Odenheimer, M. B., Painting, 22.
 Oertel, R. J. A., Painting, 21.
 Ogelvie, Painting, 21.
 O'Halloran, A. G., 32.
 O'Hara, D., Photograph, 57.
 Oil Painted Wall Paper Works, 31.
 Okerland, E. G., Photographs, 57.
 Oliver, R., Decorations, 34.
 Olivieri, L., Mosaics, 51.
 Ollendon, Mrs. d', Painting, 40.
 Ollive, A., Mosaics, etc., 41.
 Ollregon, J., Painting, 52.
 Oppenoorth, W. J., Painting, 44.
 Orlandini, L., Mosaics, 51.
 Ornamental Mirror Co., Photographs, 58.
 Ortman, Miss F. A., Paintings, 55.
 Osgood, J. R., & Co., Photographs, 58.
 Ostergren, I. P., Sculpture, 46.
 Osti, H., Photographs, 48.
 Ottanjanio, Prof. L., Sculpture, 50.
 Ottinjer, G. M., Painting, 22.
 Oudinot, A., Painting, 38.
 Overbaugh, A. W., Engravings, 29.
 Owen, J. G., Engravings, 33.
 Pabst, C. A., Painting, 38.
 Pach, G. W., Photographs, 57.
 Paez, J., Painting, 52.
 Page, W., Painting, 22; Sculpture, 15.
 Paling, J. J., Painting, 44.
 Palliere, J. L., Painting, 38.
 Palm, G. W., Painting, 47.
 Paneieur, B. V., & Bros., Sculpture, 50.
 Parker, E., Painting, 22.
 Parker, J. A., Painting, 22.
 Partini, C., Architecture, 50.
 Pape, A. jr., Painting, 22.
 Parvel, F., Painting, 22.
 Pasquinelli, Anibal, Painting, 53.
 Pattberg, L., & Bros., Photographs, 58.
 Patten, G. D., Engraving, 29.
 Patterson, J., Intaglio, 28.
 Paull, H. G., Engravings, 33.
 Paullin, W. F., Photographs, 57.
 Pautrot, J., Sculpture, 35.
 Pavia, F., Painting, 52.
 Paxon, C., & Son, Photographs, 57.
 Peale, R., Painting, 55.
 Pearce, C. S., Painting, 22.
 Pearsall, G. F. E., Photographs, 57.
 Pease, J. I., Crayon drawing, 30.
 Peck, S., & Co., Photographs, 58.
 Penel, J., Architectural designs, 41.
 Peny, E. W., Water color, 26.
 Perdicaris, I., Painting, 22; Ornaments, 31.
 Perine, G. E., Drawing, 30.
 Perkins, G. F. T., Sculpture, 15.
 Perrault, L., Painting, 38.
 Perrey, N., Sculpture, 35.
 Perry, Ann, Painting, 22.
 Perry, E., Paintings, 22.
 Perry, Painting, 22.
 Perrot, H., Models, 41.
 Perseus, E., Painting, 47.
 Pertz, A. J., Drawings, 29.
 Petersen, P., Photographs, 49.
 Petralli Bros., Sculpture, 50.
 Petrazzini, E., Paintings, 53.
 Petit, E., Painting, 38.
 Pettit, H., & Wilson, J. M., Architectural designs, 27, 31.
 Petit, P., Photographs, 41.
 Petrucci, E. A., Architecture, 50.
 Pettit, G. W., Painting, 22.
 Philippeau, C. F., Painting, 44.
 Phillips, M., Painting, 22.
 Phillips, S. H., Painting, 22.
 Photo-engraving Co., Engravings, 30.
 Pibernat, Jose, Sculpture.
 Picchi, A., Sculpture, 50.
 Picq, H., Architectural designs, 41.
 Pichot, E., Engravings and lithographs, 41.
 Pickes, D. M., Sculpture, 15.
 Pina, S., Painting, 52.

Pine, T., Painting, 22.
 Piquenard, A. H., Medals, etc., 31.
 Pisani, L., Painting, 50.
 Plassan, A. E., Painting, 38.
 Platt, G. W., Painting, 22.
 Pohle, H., Painting, 22, 55.
 Pollock, Chas., Photographs, 57.
 Pommerais, Leao, Painting, 52.
 Poncet, J. B., Engraving, 38, 41.
 Pope, A., Drawings, 27; Carvings, 28.
 Porcinai, G., Sculpture, 50.
 Porter, B. C., Painting, 22.
 Porter, S. C., Painting, 22.
 Portland Co., Photographs, 57.
 Portu, L., Painting, 52.
 Post, Miss C. von, Painting, 47.
 Postma, G., Painting, 44.
 Potin, Miss E., Painting, 40.
 Potemont, A. M., Engraving, 41.
 Potsdamer & Co., Engraving, 30.
 Pottier, Painting, 40.
 Poussielgue-Rusand, Sculpture, 42.
 Pozzo, Antonio, Photographs, 53.
 Pradez, Mrs. V., Painting, 55.
 Prang, L., & Co., Chromos, 30.
 Preda, Prof. A., Architecture, 50.
 Profili, U., Mosaics, 51.
 Priestman, J., Carvings, 28.
 Princeteau, R., Painting, 38.
 Prion, L., Painting, 38.
 Prosser, W. F., Painting, 22.
 Protais, P. A., Painting, 38.
 Province of Buenos Ayres, Photographs, 53.
 Province of Cordoba, Photographs, 53.
 Province of Rio-Grande-do-Sul, Statuary, 52.
 Province of San Luis, Decorations, 54.
 Province of Salta, Photographs, 53.
 Province of Santiago Del Estero, Photog., 53.
 Province of Tucuman, Photographs, 53.
 Quartley, A., Painting, 22.
 Quinet, A., Photographs, 41.
 Raffl & Co., Sculpture, 35.
 Rafter, S. L. J., Paintings, 22.
 Rajon, P. A., Engraving, 41.
 Ralph, Smith, & Co., Lithographs, 33.
 Randall, C., Photographs, 57.
 Randle, F., Painting, 22.
 Ramirez, A., Painting, 52.
 Rapin, A., Painting, 38.
 Rasmussen, J. E. C., Paintings, 46.
 Rathenow Optical Industrial Establishment, Photographs, 43.
 Ravacci, Ferd., & Co., Sculpture, 50.
 Ravenez, Miss A., Painting, 40.
 Reynaud, F., Painting, 38.
 Rawson, R. F., Drawings, 29.
 Ream, M., Painting, 22.
 Ream, C. P., Paintings, 22.
 Rebull, S., Painting, 52.
 Rebecque, W. C. de Constant, Painting, 44.
 Redman & Kenney, Engravings, 30.
 Rean, G., Photographs, 57.
 Reed, H., Painting, drawings, 27.
 Reed, J., Photographs, 57.
 Reis, A., Statuary, 52.
 Relvas, C., Photographs, 57.
 Rembrandt, Painting, 55.
 Remelé, P., Photographs, 43.
 René, G., Painting, 55.
 Renié, J. E., Painting, 38.
 Reniers, T. C., Sculpture, 15.
 Reich, J., Drawings, 29.
 Reichardt & Lindner, Photographs, 43.
 Reilly, J. J., Photographs, 57.
 Reimer, B. F., Photographs, 57.
 Reinecke, F., Photographs, 43.
 Remtzes, H. E., Painting, 44.
 Reinhart, B. F., Sculpture, 15.
 Restein, E. P. & L., Photographs, 30.
 Reuterdaahl, F. R., jr., Lithographs, 48.
 Revel, C., Painting, 38.
 Rham, F., Painting, 43.
 Ribatto, Francisco, Decorations, 54.
 Ribbing, Miss S., Paintings, 47.

- Ricciarelli, S., Sculpture, 50.
 Rice Bros., Photographs, 57.
 Rice, Miss E. L., Paintings, 22.
 Rice, G. S., Miscellaneous, 28.
 Rice & Co., Engraving, 30.
 Rice, J. D., Photographs, 58.
 Richards, D., Sculpture, 15.
 Richards, P. D., Industrial designs, 27.
 Richards, W. T., Painting, 22, 55; Water color, 26.
 Richner, L. P., Painting, 38.
 Ried, H. V., Painting, 22.
 Riegen, N., Painting, 44.
 Ringel, E. P. T. D., Sculpture, 35.
 Ritchie, A. H., Painting, 22; Engravings, 27.
 Ritschel, G. A., Photographs, 43.
 Rivey, A., Painting, 38.
 Robbins, Water colors, 26.
 Robbins, F. L., Painting, 22.
 Robbins, E., Painting, 22.
 Robbins, H. W., Paintings, 22.
 Robbins, F., Photographs, 57.
 Robert, C. J., Engraving, 41.
 Robertson, A., Water color, 26; Drawing, 27.
 Robinson, T., Painting, 22.
 Robinson, H. T., Photographs, 57.
 Robinson, H. S., Paintings, 33.
 Robjohns, F. R., Painting, 22.
 Rocha, Antonio da, Engravings, 52.
 Roccheggiani, C., Mosaics, 51.
 Rocher, H., Photographs, 58.
 Rochussen, C., Painting, 44.
 Rodriguez, J., Painting, 52.
 Rodriguez, N., Painting, 52.
 Roelofs, W., Painting, 44.
 Roesler, R., Photographs, 48.
 Rogers, J., Sculpture, 15; Painting, 28.
 Rogers, R., Sculpture, 15.
 Romanelli, F., Sculpture, 50.
 Romagnani, B. P., Sculpture, 50.
 Romairone, Camilo, Sculpture, 53.
 Romoli, Prof. L. C., Painting, 50.
 Romner, Mrs. H., Painting, 44.
 Roome, W., Paintings, 22.
 Roos, P., Designs, 31.
 Root, M. A., Photographs, 57.
 Ropes, J., Painting.
 Rose, A. L. de, Painting, 22.
 Rosen, Count G. von, Painting, 47.
 Rosenthal, M., Painting, 22.
 Rosenthal, T. E., Painting, 22.
 Rosier, A., Painting, 38.
 Ross, A., Sculpture, 35.
 Roth, G. A., Painting, 44.
 Rothermel, P. F., Painting, 22.
 Roubaud, L. A., Sculpture, 35.
 Rouffid, S., Painting.
 Rouffio, P., Painting, 38.
 Rougeron, J. J., Painting, 38.
 Rowe, G. A., Sculpture, 15; Engraving, 28.
 Rubens, P. P., Painting, 55.
 Ruch, Painting, 22.
 Ruckwardt, H., Photographs, 43.
 Rudaux, E. A., Painting, 38.
 Rüger, J., Drawings, 27.
 Rumbold, G. W., Statuary, 31.
 Rummelhoff, C., Painting, 49.
 Ruiz, M. J. P., Painting, 52.
 Rust, J. A., Painting, 44.
 Rydberg, G. F., Painting, 47.
 Ryder, J. F., Photographs, 57.
 Sabine, T., Photographs, 52.
 Sadee, P., Painting, 45.
 Sagedo, R., Painting, 52.
 Sain, E. A., Painting, 38.
 Saintin, J. E., Painting, 39.
 Salabert, F., Painting, 38.
 Salanson, Miss E., Painting, 38.
 Salle, E., Engravings, 41.
 Salles, J., Painting, 38.
 Salles-Wagner, Mrs. A., Painting, 38.
 Salot, J., Sculpture.
 Salomon, G., Painting, 47.
 Salt, J., Painting, 28.
 Sanchez, F., Painting, 52.
 Sand, M., Painting, 22.
 Sandberg, Mrs. C., 32.
 Sandberg, N., Painting, 48.
 Sanborn, J. A., Drawings, 29.
 Sanders, W., Drawings, 29.
 Sande, B., Painting, 45.
 Sandrot, Jose, Decorations.
 Sanderson, Miss E., Paintings, 33.
 Sandrini, A., Mosaics, 51.
 St. Joseph's Convent, Paintings, 33.
 St. Gaudens, Aug., Sculpture, 15.
 Sarony, N., Photographs, 57.
 Sartain, E., Painting, 23.
 Sartain, S., Engravings, 30.
 Sarto, A. del, Painting, 55.
 Satterlee, W., Paintings, 26.
 Saunders, J. A., Photographs, 57.
 Sauvage, F. & R. H., Sculpture, 41.
 Savoy, H., Painting, 45.
 Scappini, G. Mosaics, 51.
 Scarselli, N., Mosaics, 51.
 Schaarwachter, J. C., Photographs, 43.
 Schanche, H. G., Painting, 49.
 Schaerff, J. W., Painting, 23.
 Schauer, G. W. Engraving, 30.
 Scheck, A. F. A., Painting, 38.
 Schenkel, J. J., Painting, 45.
 Schidonné, Painting, 55.
 Schillberg & Coleman, Picture, 28.
 Schipperus, P. A., Painting, 45.
 Schive, J., Painting, 49.
 Schlesinger, L., Photographs, 59.
 Schluter, B., Photographs, 59.
 Schmidt, Geo., 32.
 Schell, F. B., Drawing, 29.
 Scholten, J. H., Painter, 45.
 Scholz, R., Photographs, 43.
 School of Design, Designs, 29.
 Schovelin, A., Painting, 46.
 Schrader, J., Painting, 55.
 Schroeder, L., Sculpture, 35.
 Schreiber & Co., Lithographs.
 Schreiber & Sons, Photographs, 57.
 Schultz & Suck, Photographs, 43.
 Schulze & Steinmetz, Designs, 31.
 Schulze, P., Designs, 31.
 Schumaker, J. G., Painting, 26.
 Schussele, C., Painting, 23.
 Schwartzmann & Kafka, Archi. designs, 27.
 Schwerin, Miss A. von, Painting, 48.
 Schreiber & Co., Photographs, 53.
 Schwier, K., Photographs, 43.
 Schwind & Krueger, Photographs, 57.
 Scott, G. B., Photographs.
 Scott, W. W., Paintings, 23.
 Scovill Mfg. Co., Photographs, 58.
 Seavey, L. F. W., Photographs, 57, 58.
 Scawell, C. H., Design, 32.
 Sébillot, P., Painting, 38.
 Sebastian de Anteaigo, Painting, 52.
 Sebron, H., Painting, 38.
 Seelig & Co., Sculpture, 15, 28.
 Segé, A., Painting, 38.
 Seggern, F. van, Painting, 45.
 Seiler, C., Photographs, 57.
 Seitz, O., Painting, 55.
 Seligman, Mrs. E., Painting, 23.
 Selim, Mrs. H., Painting, 38.
 Sell, E. E., Needle work, 32.
 Sellack, G., Photographs, 53.
 Semmendinger, A., Photographs, 58.
 Seillan, Louis, Sculpture, 53.
 Sewell, E. W., Paintings, 33.
 Shade, Painting, 23.
 Shakspeare, Photographs, 34.
 Shapleigh, F. H., Painting, 23.
 Sharps, I. S., Painting, 23.
 Shattuck, Paintings, 23.
 Shaw, A. C., Painting, 23.
 Shearer, C. H., Painting, 23.
 Sheldon & Slasons, Pedestals, 31.
 Sherk Brothers, Painting, 22.
 Sheureux, L. E., Plans, etc., 42.

- Shirlau, W., Painting, 23.
 Siber, C., Oil prints, 43.
 Sibley, S. D., & Co., Photographs, 58.
 Sidwall, Miss A., Paintings, 47.
 Sillery Convent, Picture in hair, 33; Painting.
 Sillstedt, Painting, 23.
 Silva, F. A., Paintings, 23.
 Silveira, Souza, da, Painting, 52.
 Simon, H., Painting, 23.
 Simons & Co., Mosaics, etc., 42.
 Simonsen, P., Painting, 49.
 Sinding, O., Painting, 49.
 Sinding, S., Sculpture, 49.
 Siotto, P., Cameos, 50.
 Sirouy, A., Painting, 39.
 Skari, E. O. R., Painting, 49.
 Skirmunt, S. de, Painting, 23, 55.
 Skonberg, C. E., Painting, 48.
 Slack, S., & Co., Photographs, 32.
 Sluyter, H., Engravings, 45.
 Smart, F. L. & R. M., Engravings, 30.
 Smibet, J., Painting, 55.
 Smillie, J. D., Water color, 26.
 Smillie, G. H., Paintings, 23; Water color, 26.
 Smith, T. H., Portraits, 23.
 Smith, R., Painting, 22.
 Smith, I. H., Painting.
 Smith, J. B., Shield of liberty, 32.
 Smith, X., Painting, 23.
 Smith, H. F., Painting, 49.
 Smith, M., Painting, 23.
 Smith, R., & Co., Lithographs, etc., 33.
 Smith, T. Henry, Paintings, 23.
 Smith, F. H., Painting, 23; Water color, 26.
 Smith, T. L., Paintings, 23.
 Snowe, F., Painting, 23.
 Snowdon, T. H., Sculpture, 28.
 Sodergren, Miss S., Painting, 47.
 Soeterik, T., Painting, 45.
 Solomon, J., Photographs, 57.
 Sonntag, W. L., Painting, 22.
 Sooryn, D., Sculpture, 54.
 Sorensen, C. F., Painting, 46.
 Spahn, E. P., Photographs, 58, 57.
 Spang, W., Painting, 23.
 Spalding, A. E., Sculpture, 28.
 Spalding, H. M., Sculpture, 28.
 Spencer, J. W., Painting, 22.
 Spieler, C. H., Painting, 23.
 Spooner, M. C., Spatter work, 32.
 Springer, C., Painting, 45.
 Staigg, R. M., Painting, 23.
 Stancliff, J. W., Painting, 22.
 Stanhouse, W., Engravings, 27.
 Stanley, D. M., Painting, 22.
 State of Michigan, Drawings, 31.
 Steele Bros., Engravings, 28.
 Steffelaar, J., Painting, 45.
 Stehlin, J., Sculpture, 28.
 Steinbock, R., Chromo-lithographs, 42.
 Steinhaus, W., Drawings, 29.
 Steinhaus & Frickerhaus, 32.
 Stencil, G. A., Drawings, 27.
 Stephenson, Miss J., Paintings, 33; Oriental table, 34.
 Sterling, Miss C. H., Painting, 26.
 Stevenson, B. F., Painting, 23.
 Stewart, G., Painting, 55.
 Stewart, J. L., Painting, 23, 55.
 Stillfried & Anderson, Photographs, 57.
 Stoddard, S. R., Photographs, 57.
 Stokes, J., Painting, 23.
 Stock, J., & Bro., Photographs, 58.
 Stoll, J. A., Relieves, 32.
 Stone, W. O., Painting, 55.
 Stortenbeker, P., Painting, 45.
 Stoppel, H., Water color, 26.
 Story, G. H., Paintings, 22.
 Story, A. B., Painting, 23.
 Storn, N., Decorations, 54.
 Strain, D. J., Painting, 23.
 Stroebel, J. A. B., Painting, 45.
 Stroefel & Kinchner, 32.
 Strong, J. D., jr., Painting, 23.
 Stuart, A. H., Decorations.
 Stuart, H., Decorated table, 34.
 Stuart, G., Painting, 55.
 Stubenbord, C., 33.
 Sulzbacher, L., Decorations, 28.
 Susse Frères, Models, 42.
 Swayne, W. M., Sculpture.
 Sweeney, T. T., Photographs, 57.
 Sword, J. B., Painting, 23.
 Symington, James, Water color, 27.
 Szacinski, L., Photographs, 49.
 Taanman, J., Painting, 45.
 Tacquemart, S. F., Engraving.
 Tait, A. F., Painting, 24.
 Tait, J. R., Painting, 23.
 Taft, R., Painting, 23.
 Tagliarino, A., & Co., Photographs, 50.
 Tapestries National Manufactures, Tapes-tries, 40.
 Tappa, P., Photographs, 53.
 Taylor, W. C., Photographs, 57.
 Technico-Typographic Institute, Engravings, 42.
 Teka, Mrs. E., Painting, 40.
 Telon, J., Sculpture, 35.
 Tenney, U. D., Painting, 24.
 Tensfeld, J., Painting, 23.
 Terzi, A., Lithographs, 50.
 Testas, W. de F., Painting, 45.
 Thaulow, F., Painting, 49.
 The Decorative Wood Co., 32.
 The Commission, Argentine Rep., Views, 53.
 Therenni, F., Photographs, 58.
 Thomas, E., Engraving, 41.
 Thomas, Joseph S., Painting, 24.
 Thomas, Mrs., Painting, 24.
 Thomson, H., Painting, 24.
 Thompson, A., Painting, 24.
 Thompson, A. W., Paintings, 23.
 Thompson, H. I., Painting, 23.
 Thompson, J., Painting, 24.
 Thorn, Paintings, 24.
 Thorne, G. W., Photographs, 57.
 Thorp, A. C., Painting, 23.
 Thorpe, T. B., Painting, 24.
 Thurlow, Mrs. S. W., Painting, 24.
 Thurman, P., Painting, 49.
 Tiffany, L. C., Paintings, 24; Water colors, 26.
 Tillier, C., Industrial designs.
 Tiers, M. C., Painting, 24.
 Tieleman, B., Photographs, 43.
 Timon, M. P., Photographs, 57.
 Titian, Painting, 55.
 Tobias, W., Painting, 29.
 Tom, J. B., Painting, 45.
 Tompkins, A. B., Painting, 26.
 Tompkins, Miss C., Painting, 23.
 Törna, O., Painting, 47.
 Torrini, G., Mosaics, 51.
 Townsend, C. E., Painting, 24.
 Train, H. E., Photographs, 57.
 Trapp & Munch, Photographs, 43.
 Trautmann, J. W., Decorations, 43.
 Treat, O. C., Painting, 23.
 Trego, J. R., Painting, 23.
 Tresling, P. O., Lithographs, 44.
 Tright, H. A. van, Painting, 45.
 Troitzsch, O., Oil prints, 43.
 Trotter, N. H., Painting, 23.
 Troublé, Industrial designs, 42.
 Trumbull, G., Painting, 23.
 Truman, E., Painting, 55.
 Tuckerman, S. S., Painting, 24.
 Turner, J. W., Photographs, 57, 58.
 Turini, G., Sculpture, 15.
 Tuttle, C. F., Painting, 24.
 Tyson, I. T., Photographs, 57.
 Ugolini, G., Mosaics, 51.
 Ulfsten, C., Painting, 49.
 Ulke, H., Painting, 24.
 Ulmann, B., Painting, 39.
 Union Centrale des Beaux-Arts, Eng., 41.
 Vacquerel, P. E., Engravings, 41.
 Valadon, J. E., Painting, 39.

- Valero, Felipe, Sculpture.
 Valkenburg, H., Painting, 45.
 Vallejo, F. A., Painting, 52.
 Vance, R. H., Photographs, 57.
 Vandaël, Painting, 55.
 Vandusen, Rab., Engraving, 30.
 Van Dyke, Painting, 55.
 Van Etten, K., Painting, 24.
 Van Elton, Paintings, 27.
 Van Loo, G., Photographs, 57.
 Vargas, A., Sculpture, 52.
 Varin, E. N., Engravings, 41.
 Vasquez, J., Painting, 52.
 Vasquez, A., Painting, 52.
 Vasquez, M., Painting, 52.
 Vasselot, A. M. de, Sculpture, 35.
 Vasseud, L., Drawings, 27.
 Vedder, Miss E., Painting, 24.
 Vega, F. de la, Painting, 52.
 Vély, A., Painting, 39.
 Venine, Painting, 27.
 Venino, F., Painting, 24.
 Venius, O., Painting, 55.
 Veron, A. R., Painting, 39.
 Verschuur, W., jr., Painting, 45.
 Vester, W., Painting, 45.
 Verbeer, E., Painting, 45.
 Verzaschi, E., Photographs, 50.
 Vichi, F., Mosaics, 51.
 Vigdal, A. G., Painting, 49.
 Viger, H. J. L., Painting, 39.
 Villa, E., Painting, 39.
 Villalprando, C., Painting, 52.
 Villebesseyx, G., Painting, 39.
 Villeneuve, T., Sculpture, 33.
 Virgin, A. J. G., Painting, 48.
 Visconti, C., Lithograph, 50.
 Vogel, H., Photographs, 43.
 Vogel, J. G., Painting, 45.
 Volk, D., Painting, 24.
 Volk, L. W., Sculpture, 15.
 Volkmar, C., sr., Photographs, 58.
 Volkmar, C., jr., Paintings, 30, 24, 28.
 Vollmering, J., Painting, 24.
 Vos, Mrs. M., Painting, 45.
 Vuagnot, F., Painting, 39.
 Waagen, Sculpture, 35.
 Wahlberg, H. A. L., Painting, 48.
 Wahlquist, E., Painting, 48.
 Waitz, R., Painting, 25.
 Waldhaw, J., Photographs, 58.
 Wallander, W., Painting, 48.
 Wallander & Forslow, 48.
 Wallace, E., Photographs, 58.
 Walery, Photographs.
 Walker, A., Decoration on Glass, 34.
 Wall, W. A., Painting, 24.
 Walls, W., Photographs, 58.
 Waller & Schrader, Photographs, 58.
 Waller, F., Painting, 24.
 Walter, T., Decorations, 29.
 Ward, E. M., Painting, 25.
 Warner, O. L., Sculpture, 15.
 Warners, Painting, 25.
 Warren, C. K., Photographs, 58.
 Wästfelt, C. C., Sculpture, 46.
 Waterman & Hall, Photographs, 57.
 Waterman, M., Painting, 24, 25.
 Waters, G. W., Painting, 24.
 Waters, S. C., Painting, 25.
 Watkins, C. E., Photographs, 58.
 Waugh, T. B., Painting, 25.
 Way, A. J. H., Painting, 24.
 Way, A. C., Painting, 24.
 Way, C. G., Painting, 24.
 Weaver, A. K., Photographs, 58.
 Webb, Francis R., Painting, 24.
 Weber, C., Painting, 24.
 Weber, P., Painting, 24.
 Weeks, E. L., Painting, 25.
 Weenix, Painting, 55.
 Weilenbeck, F. R., Painting, 25.
 Weir, J. F., Painting, 24.
 Weir, R. W., Painting, 24.
 Weiss, N., Carvings, 28.
 Weissenbruch, J., Painting, 45.
 Welch, T., Painting, 25.
 Weltmüller, Painting, 55.
 Wendroth, F. R., Photographs, 58.
 Werner, G., Painting, 48.
 Wertmuller, Painting, 55.
 West, B., Painting, 55.
 West, P. B., Painting, 24.
 West, C., Painting, 25.
 West, S., Stained glass, 32.
 West & Anderson, Designs, 31.
 Weston, N., Photographs, 57.
 Wexelsen, C., Painting, 49.
 Wharton, P. F., Painting, 25.
 Whittredge, Painting, 25.
 Whitbridge, Paintings.
 Whitechurch, P., Engravings, 30.
 White, E., Paintings, 25.
 White, H. C., Photographs, 58.
 White, J., Decorations, 34.
 Whiteman, M. H., Painting, 24.
 Whitefield, E., Painting, 25.
 Whitman, M. H., Drawing, 29.
 Whitney, Anna, Statuary, 15.
 Whiton, H., & Co., Signs, 32.
 Wiesman, W. H., Painting, 25.
 Wiesenbahn, F. W. H., Penmanship, 32.
 Wiklund, O., Photographs, 48.
 Wiggeland, D., Painting, 24.
 Willard, A. M., Painting, 24.
 Willard, W., Painting, 24.
 Wild, H. G., Painting, 25.
 Wild, H., Painting, 25.
 Willenich, M., Painting, 39.
 Wiles, L. M., Drawing, 29.
 Williams, I. L., Painting, 25.
 Williams, Mrs. E. F., Painting, 24.
 Wiles, L. M., Painting, 24.
 Wilson, J. J., Photographs, 58.
 Wilson, R., Painting, 55.
 Wilson, Hood, & Co., Photographs, 58.
 Wilson, O., Painting, 24.
 Wilson, Miss L. R., Drawing, 29.
 Wilt Bros., Photographs, 58.
 Windt, P. P., Painting, 45.
 Winge, M. E., Painting, 48.
 Winge, Mrs. M., Painting, 48.
 Winner, W. E., Painting, 24, 29.
 Winter, I., Painting, 24.
 Winters, Mrs. D., Painting, 24.
 Wittemar & Bros., Engraving, 30.
 Witmar, C. F., Painting, 24.
 Wolf, G., Photographs, 43.
 Wolf, W., Painting, 55.
 Wollrabe, H. W., Photographs, 45.
 Wood, T. W., Paintings, 27.
 Wood, R. E., Photographs, 58.
 Wood, G. B., jr., Painting, 24, 27.
 Woodward, Grant, & Co., Sculpture, painting, etc., 33.
 Woodward, D. A., Photographs, 58.
 Woodwell, J. R., Painting, 24.
 Worton, W. E., Painting.
 Wright, G., Painting, 25.
 Wright, J., Decorations, 34.
 Wührer, L., Engravings, 41.
 Yedo, B., Sculpture, 53.
 Yon, E. C., Painting, 39.
 Yvon, A., Painting, 39.
 Zetterström, Mrs. M., Painting, 48.
 Zettler, F. X., Chromo-lithographs, 42.
 Zier, F. E., Painting, 39.
 Zimmerman, C. A., Photographs, 58.
 Zuber-Buhler, F., Painting, 39.
 Zuber, J. H., Painting, 39.

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